

Permit ID	S-00357
Part	IV
Rev Date	01/31/11

PART IV GENERAL OPERATIONS INFORMATION

- A. Indicate the type(s) of mining activity to be undertaken within the permit area and the acreage to be encompassed by each type:

<u>Mining Activity</u>	<u>Acres</u>
[X] Area Mining	815.0
[] Contour Mining	
[X] Auger/Thin seam Mining	50.0
[] Combined Surface and Underground	
[X] Haul Roads or Access Roads	35.5
[X] Impoundments	80.6
[] Coal Combustion By-Products	
[X] Coal Processing Facilities	10.0
[X] Coal Processing Waste Disposal	862.5
[X] Lands to Remain Undisturbed	328.6
[X] Other Support Facilities (list below)	715.0

Mine management area, soil/ BAM stockpile areas, fringe areas (reclamation contour blending areas) slurry lines, slurry reclamation blending area, connecting roads.

- B. Anticipated Coal Production:

Annual Anticipated Coal Production	2,500,000	Tons
Total Coal Production from Permit	13,000,000	Tons

- C. Major equipment to be used for all phases of Mining and Reclamation:

1. Equipment used for mining:

Excavators	Hitachi 1800	Dozers	Cat D7, D8, D9, D10 & D11
Loaders	Cat 988 & 992	Drills	Drilltech D45, I-R DML
Trucks	Cat 777 & Triaxle Trucks		

2. Equipment used for reclamation:

Loaders	Cat 988 & 992	Scrapers	Cat 637
Trucks	Cat 777 50 & 95 T Rock Trucks	Graders	Cat 16
Dozers	Cat D7, D8, D9 & D10		

3. Other equipment and its use(s):

Misc Trucks [equipment maintenance, fueling, dust control, etc]
 Lifting Equip [forklifts & cranes for equipment maintenance]
 Pumps [water management]
 Light Plants [illuminate work areas]
 Generators [electric power supply]
 Crushing Facility: Conveyors, Crusher/s, Breaker/s, Hopper/s [size and convey product to storage/ loadout areas]

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D. Will any existing structures (sediment ponds, other water impoundments, coal refuse disposal sites, haul or access roads, diversion ditches, excess spoil disposal areas, conveyors, rail transportation systems, support facilities, utility installations, etc.) which were constructed for the purposes of, or as a result of, mining activities, for which there are design/construction performance standards in 312 IAC 25-6 pursuant to 312 IAC 25-4-6, and which construction began prior to the implementation of IC 14-34 (IC 13-4.1) be used in connection with or to facilitate mining?

☒ YES ☐ NO

If "YES", complete Attachment IV.D.

E. Mine Plan:

1. Show the portion of the permit area to be affected by surface mining and reclamation operations on the Operations Map, and indicate the total acreage to be disturbed below:

Acres to be Disturbed 1703.6 (Approx.)

See Map 6, Operations Plan.

2. For each pit, show the location of the initial cut, any associated box cut spoil storage area, areas and limits of coal extraction, last (final) cut and direction of pit advancement on the Operations Map.

See Map 6, Operations Plan.

3. Describe the method of operation, including the timing, anticipated pit length and width, and spoil placement for each pit and approximate schedule for activation and completion of operations for each pit:

Overburden and parting removal will be accomplished with a combination of dozers, loaders, hydraulic shovels and haul trucks in a direct haulback operation. Once soils have been removed as required, the overburden and parting will be blasted and either hauled or pushed into the previously excavated pit. The pits will usually be 100'-200' wide and range in length from 400'-4,000'. A typical pit will require 2-6 weeks to backfill. Backfilling and rough grading will typically be completed within 180 days of pit completion. Mining within the permit area will occur initially in the IC#1 mining sequence. Prior to commencement of mining in the IC#1 sequence, the existing previously mined pit will be partially or completely dewatered. The IC#1 pit will then advance northward and later in a northwesterly direction and will terminate in the location of Final Cut #1 as depicted on MAP 6. The existing previously mined pit will be spoiled into utilizing materials excavated from the IC#1 pit. Utilization of the existing previously mined pit for spoil deposition should provide ample volume to offset the volume that will be lost by constructing a final pit impoundment in the location of Final Cut #1 (FC1). In order to maintain the appropriate post mine elevations for the restored flood plain, overburden swell material from within the flood plain area will be disposed of by raising the valleys flowing west to east and raising the ridges between the valleys along the western side of the mining area. At no time during mining on this permit will there be more than four (4) open pits.

As mining advances north, a series of levees/sediment basins will be constructed to control affected area drainage as well as keep the Pigeon Creek flood waters from encroaching into the active mining area. Prior to constructing any levees, excavations shown on map #6 will be completed to facilitate flow in Pigeon Creek by expanding the flood plain. Levees will be constructed starting with Phase I and ending with Phase IV. The excavated material from the construction of the basins in the Pigeon Creek flood plain will be used to construct the levees. Any material in excess of what is needed to construct the levees will be stored outside the flood plain. Overland flow ditches will be constructed to divert unaffected drainage around the levees. Although the overland flow ditches will be mined through, affected area drainage will not be allowed to pass through these structures. Once the pit has advanced far

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enough past an overland flow ditch, a permanent replacement ditch as shown on map #6, will be constructed in the reclaimed area behind the advancing pit. This drainage will be controlled through sediment basins.

- 4. Describe plans for backfilling, grading and compaction of spoil and the elimination of highwalls to meet the requirements of 312 IAC 25-1-12, including analysis that affirmatively demonstrates that the final contours will meet a minimum static safety factor of 1.3:**

The areas mined will be backfilled and graded to blend with the surrounding area to approximate the pre-mine contours, and complement drainage patterns. On previously mined areas, the pre-mine contours are unknown to this permittee as there are old mine spoil ridges, old pits and/ or impoundments and old highwalls. The pre-mining contours for these areas are not depicted on the USGS topographic quadrangle maps for this area. Some of the old spoil ridges, pits/ impoundments and old highwalls may be re-affected by mining activity authorized by this permit. Reclamation of these areas will be completed to compliment surrounding unmined areas and areas that are disturbed and subsequently reclaimed under this permit. The flatter areas will remain predominately flat and the steeper areas may be lessened and/or reconfigured so that these areas lend themselves better to the post mining land-uses. The spoil will be compacted as necessary to control slope stability by frequent traversing of the area by the reclamation equipment. All exposed highwalls resulting from or affected by mining operations within this permit will be eliminated.

In mining up to 160' of this type material, the anticipated swell factor will be approximately 25 to 30%. Even after removing the coal, this leaves about 40' - 50' average increase in replaced material depth. This increase may be somewhat offset by the amount of previously-mined (existing) open pits that are on the southern portion of the permit that will be used for deposition of spoil materials. Since blending to surrounding terrain is required, this swell will be distributed more toward the middle of a mining area where the increase in elevation may be even more. Even with this increase, approximate original contour as defined by 312 IAC 25-1-12 will be achieved. The reclaimed surface configuration will be similar to pre-mining with some rounding and lengthening of slopes and filling and/or flattening of some valleys. Drainage patterns will approximate pre-mining patterns and the mined area will blend with the surrounding terrain. In portions of the previously mined areas that are disturbed during operations conducted under this permit and where drainage patterns are essentially non-existent, surface contours that will provide positive drainage and/or benefits for the approved post-mining land uses will be created. Please see the Pre/Post Mining Topographic Cross-Sections and the Reclamation Plan Map (Sheet 2 of 2).

- 5. Will rough grading of any portion of the permit area require more than 180 days following mining related disturbance?**

☐ YES ☒ NO

If "YES", provide the maximum acreage involved and complete justification and reasons that reclamation cannot be completed within that time frame:

- 6. Submit contour maps or cross-sections that depict the anticipated final surface configuration of the permit area.**

See Pre/Post Mine Topographic Cross-Sections (RECLAMATION PLAN MAP – SHEET 2 of 2)

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7. Describe the measures to be taken to maximize the use and conservation of the coal resource within and adjacent to the permit area:

The pre-mine drilling program identifies geologic considerations for the coal reserve base. This information is then used to develop a mining plan, wherein an engineering design and mine operations sequence are prepared to optimize efficiencies of labor and equipment. These measures ensure economic viability of the mine plan, and include the removal of all coal where economically feasible.

8. For the disposal of non-coal wastes generated by the operation:

- a. Describe the measures to be used to ensure that all non-coal wastes generated by the operation (including grease, lubricants, paints, flammable liquids, office wastes, garbage, abandoned machinery, timber, brush and other combustibles) are properly disposed and stored in accordance with 312 IAC 25, and identify the non-coal wastes that are to be disposed of within the permit area:

Non-coal mine wastes including greases, lubricants, paints, flammable liquids, and other potentially hazardous wastes generated during mining and reclamation operations shall be stored temporarily in a controlled manner within the permit area and thereafter transported off-site for disposal at an approved state waste facility. Placement and storage shall ensure that surface runoff and leachate do not degrade surface or ground water. Combustible wastes shall be stored to assure that fires are prevented. Materials that may reasonably be recycled, will be recycled. Nonhazardous solid wastes may be taken to and disposed of at approved Indiana solid waste disposal sites. Should non-coal waste be disposed of in the pit, it will be covered with a minimum of 2' of non-toxic, non-combustible material. Timber and brush will be disposed of in the active pit, following coal removal; or such materials may be used to enhance wildlife habitat. Timber and brush may be piled and burned with proper authorization.

- b. Show the location(s) of all storage and disposal sites on the Operations Map.

See Map 6, Operations Plan.

9. Transportation Facilities:

- a. Identify and provide the maximum length of each haul road, access road, conveyor (other than conveyors used to transport coal within a coal preparation facility) or railroad to be constructed, modified, used or maintained within the proposed permit area:

Facility Identification	Length [ft]
HR#1	4800
HR#2	10800

- b. Show the location of each transportation facility on the Operations Map.

See Map 6, Operations Plan.

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- c. **Submit typical cross-sections of each haulroad or access road showing the road width, berms, ditch installations, cut and fill side slopes, and a description of the materials to be used in their construction.**

See Attachment IV.E.9.c.

- d. **Describe measures to be undertaken to ensure that each transportation facility listed in 9.a. above will be constructed or reconstructed, and maintained to prevent, to the extent possible additional contributions of suspended solids to stream flow or runoff outside the permit area:**

Portions of the access and haul roads proposed are located in areas where sediment control is present. Runoff from other areas will be controlled so as to minimize the off-site suspended solids contributions. Control measures will include vegetation of the access and haul road sideslopes and affiliated ditches with the pasture seed mix specified in Part VII. Further measures may include: rock check dams, berms, silt fences, straw bales, or the use of an approved sediment basin.

- e. **Culverts:**

- (1). **Show on the Operations Map the location, length and size of all culvert installations proposed for haulroads or access roads and rail transportation systems and submit a typical cross-section(s) of a culvert installation showing the inlet and outlet protection to be provided and the depth of cover over a culvert.**

See Map 6, Operations Plan.

- (2). **Submit the parameters used in determining the size for each culvert, including culvert length, slope, manning coefficient, etc., as Attachment IV.E.9.e.(2).**

See Attachment IV.E.9.e.2

- f. **Bridges:**

- (1). **Show on the Operations Map the location of all bridge installations proposed for haulroads, access roads or rail transportation systems.**

Not Applicable.

- (2). **Submit specifications for each bridge installation as Attachment IV.E.9.f.(2).**

Not Applicable.

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g. Transportation Facility Removal and Reclamation:

- (1). Provide the plans for the reclamation/removal, final grading, topsoil replacement and revegetation of each transportation facility:**

After mining is complete and reclamation efforts are underway, these roadways will be removed as part of the final grading process unless otherwise approved to remain permanently. The material used to construct these roads that requires removal will be disposed of in a final cut pit or will be respread over spoil as part of the grading phase. Topsoil will then be redistributed as identified in Part VII, depending upon the area of location (prime or non-prime). Revegetation efforts discussed in Part VII, elaborates as to the particular operations to be performed and will include these road areas along with the rest of the permit.

- (2). Provide cross-sections that show the final surface contour of each reclaimed facility, depth of cover material and any portion of each facility that may remain in place below the final surface.**

See Attachment IV.E.9.g.2.

- F. Have potential acid-forming or toxic-forming materials been identified or are they known to exist within the permit area?**

☒ YES ☐ NO

If "YES", provide as Attachment IV.F., based upon the results of geologic sampling, the identity of all potentially acid or toxic forming strata which will be encountered during the proposed mining operation and describe the measures to be used and handling procedures to be implemented to ensure that all acid-forming and toxic-forming materials disturbed by the coal mining and reclamation operation are adequately covered with nontoxic and noncombustible earthen material or treated to avoid contamination of surface and ground water resources within and adjacent to the permit area, to prevent sustained combustion and to minimize adverse effects on plant growth and the approved postmining land use.

Attachment IV.F.

Acid and toxic forming materials, including any remnant coal left on the surface associated with the coal processing area operations, will be buried under at least 2 feet of non-toxic non-combustible earthen material. When possible this material will be buried in the bottom of the pit and below the water table. The material will not be stored or placed in or near a drainageway. To prevent sustained combustion, material that shows signs of combustion will be covered with a non-combustible material to limit the oxygen needed for combustion. This material will be compacted. The equipment used to handle toxic materials is included in IV.C.1.&2. If an area is not covered with 2' of original unconsolidated material it will be tested in cooperation with the Division of Reclamation Geologist, and treated with lime at the recommended rate. All spoiled or slurry coal material will be treated as acid and toxic material unless an analysis is available that indicates a neutral or alkaline character for that material. Acid or toxic materials are considered to be those materials with a pH < 4.0 or deficient in calcium carbonate to a value of ≥ 5.0 or more tons/1000 tons (See attachment V.B.4).

- G. Will coal processing wastes (gob and slurry) be produced by this operation or be disposed of within the permit area?**

☒ YES ☐ NO

If "YES", complete Attachment IV.G.

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H. Management of Drilled Holes and Other Openings:

1. With the exception of holes drilled explicitly for and used in blasting operations, describe measures to be taken to plug, case, or manage exploration holes, other boreholes, wells and other openings within the permit area:

Borings which penetrate a significant aquifer will be sealed with neat cement, a bentonite slurry, or granular bentonite at least two (2) feet above and below the aquifer or screen. The remainder of the hole will be backfilled with drill cuttings. Monitoring wells not mined through will be plugged in a like manner. Holes that do not penetrate an aquifer will be plugged with drill cuttings. A DOR Plugging and Abandonment Report will be submitted to the DOR for each exploration drill hole and compliance monitoring well drilled by the operator in accordance with the approved procedures.

2. Submit a typical cross-section(s) showing how drilled holes, other than blastholes, wells or other exposed underground openings will be plugged, cased or managed.

See Attachment IV.H.2.

3. Show the proposed locations of all boreholes, wells and other such openings on the Operations Map.

See Map 4, Environmental Resources [Hydrogeologic Information].

I. Blasting Plan:

Is blasting to be conducted at any point during the operation of the mine?

☒ YES ☐ NO

If "YES", complete and attach Attachment IV.I.

See Attachment IV.I.

J. Excess Spoil:

Is any spoil in excess of that needed to restore the approximate original contour of the permit area to be created by this operation?

☐ YES ☒ NO

If "YES", complete Attachment IV.J.

- K. Provide the measures to be employed during site preparation, mining and reclamation to control dust generated by those activities from causing damage to properties beyond the permit area:**

All exposed surfaces shall be protected and stabilized to effectively control and limit erosion and the dust [fugitive dust] generated by mining and reclamation operations. Fugitive dust control measures may include, but are not limited to, periodic watering, chemical stabilization of unpaved roads, frequent grading and compaction of roads to stabilize road surfaces, mulching, and/or revegetation.

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L. Augering Operations:

Is auger mining to be conducted?

☒ YES ☐ NO

If "YES", complete Attachment IV.L.

M. Surface Mining Near Underground Mines:

Will surface mining activities, including augering operations, be conducted within 500 feet of an active or abandoned underground mine?

☒ YES ☐ NO

If "YES", complete Attachment IV.M.

N. Are the predominant slopes of the area to be mined in excess of 20° (35%)?

☐ YES ☒ NO

If "YES", Submit as Attachment IV.N detailed maps, plans and cross-sections which identify the steep slope area(s) and demonstrate that operations will be conducted in accordance with 310 IAC 12-5-150 through 12-5-154.

O. Is any coal combustion by-products to be disposed within the permit area?

☐ YES ☒ NO

If "YES", complete Attachment IV.O.

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Attachment List

Attachment IV.D	Existing Structures
Attachment IV.E.9.c	Typical Cross-Section Haulroad
Attachment IV.E.9.e.2	Culvert Design Parameters
Attachment IV.E.9.g.2	Typical Cross-Section Reclaimed Transportation Facility
Attachment IV.G	Coal Processing Waste Disposal
Item F	Typical Cross-Section Coal Processing Waste Disposal
Attachment IV.H.2	Typical Cross-Section Borehole Plugging Methods
Attachment IV.I	Blasting Operations
Item A.1.a	Blasting Limits Information
Item A.1.b	Pipeline & Well Specifications
Item A.2.b	Blast Monitoring Equipment Information
Item F.3	Blast Design
Item G	Blast Record Form
Item H	Blast Schedule
Attachment IV.M	Surface Mining Near Underground Mines

EXISTING STRUCTURES

- A. List the structures to be used and indicate if each structure meets the applicable performance standards of 312 IAC 25:**

SB 005
 RB 001
 SB 007
 SH-72
 SH-73
 Greenbrier Road Bridge

Note: These structures currently meet the applicable performance standards of 312 IAC 25.

- B. Show the location of each structure on the Operations Map.**
- C. Submit plans or photographs of the structure that describe or depict its current condition as Attachment IV.D., ITEM C.**

See Part VI, Attachment B.2.b(2) and Attachment IV.D., Item C.

- D. Provide as Attachment IV.D., ITEM D., for structures listed in A above which do not meet the performance standards of 312 IAC 25, submit plans for the modification or reconstruction of each structure which meet the applicable standards, including a schedule to achieve compliance with the applicable standards.**

N/A

- E. For each structure listed in A above, provide plans to be implemented for the maintenance and reclamation as Attachment IV.D, ITEM E.**

Any existing structures used as sediment control structures will be maintained and reclaimed as stated in Part VI.B.2.b.3.(A),(C)&(D) and Part IV, Attachment G, (E). Existing structures used for slurry disposal will be maintained and reclaimed as stated in Attachment IV.G.E.

Attachment IV.D, Item E.

In the case of the existing structures used for drainage control and slurry disposal, the reclamation of these structures will be deemed successful when the following reclamation techniques are achieved. 1) the quality of the water within these structures will be within acceptable limits at the time of final bond release. The parameters to be checked at final bond release will be the normal parameters checked for an outfall in reclamation status. Any affected slopes, inlets or outlets to the structures must be stable and planted with the applicable species noted in Attachment VII.B.2.a. Post mine water levels for these structures may range from 0 feet to the pre-mine levels or above which are appropriate for this area since these levels fluctuated prior to our activities and in any event augment the surrounding wildlife land uses.

The Greenbrier Road Bridge is proposed to be used as a support structure for the slurry line over Pigeon Creek. The bridge is abandoned but still a viable structure capable of supporting the weight of the slurry line. For specifics regarding the placement of the line on the bridge over Pigeon Creek, see Attachment IV.G., Item C.

Permit ID S-00357 Attachment IV.D. Rev Date 03/20/13

EXISTING STRUCTURES

- A. List the structures to be used and indicate if each structure meets the applicable performance standards of 312 IAC 25:**

SB 005
 RB 001
 SB 007
 SH-72
 SH-73
 Greenbrier Road Bridge

Note: These structures currently meet the applicable performance standards of 312 IAC 25.

- B. Show the location of each structure on the Operations Map.**
- C. Submit plans or photographs of the structure that describe or depict its current condition as Attachment IV.D., ITEM C.**

See Part VI, Attachment B.2.b(2)

- D. Provide as Attachment IV.D., ITEM D., for structures listed in A above which do not meet the performance standards of 312 IAC 25, submit plans for the modification or reconstruction of each structure which meet the applicable standards, including a schedule to achieve compliance with the applicable standards.**

N/A

- E. For each structure listed in A above, provide plans to be implemented for the maintenance and reclamation as Attachment IV.D, ITEM E.**

Any existing structures used as sediment control structures will be maintained and reclaimed as stated in Part VI.B.2.b.3.(A),(C)&(D) and Part IV, Attachment G, (E). Existing structures used for slurry disposal will be maintained and reclaimed as stated in Attachment IV.G.E.

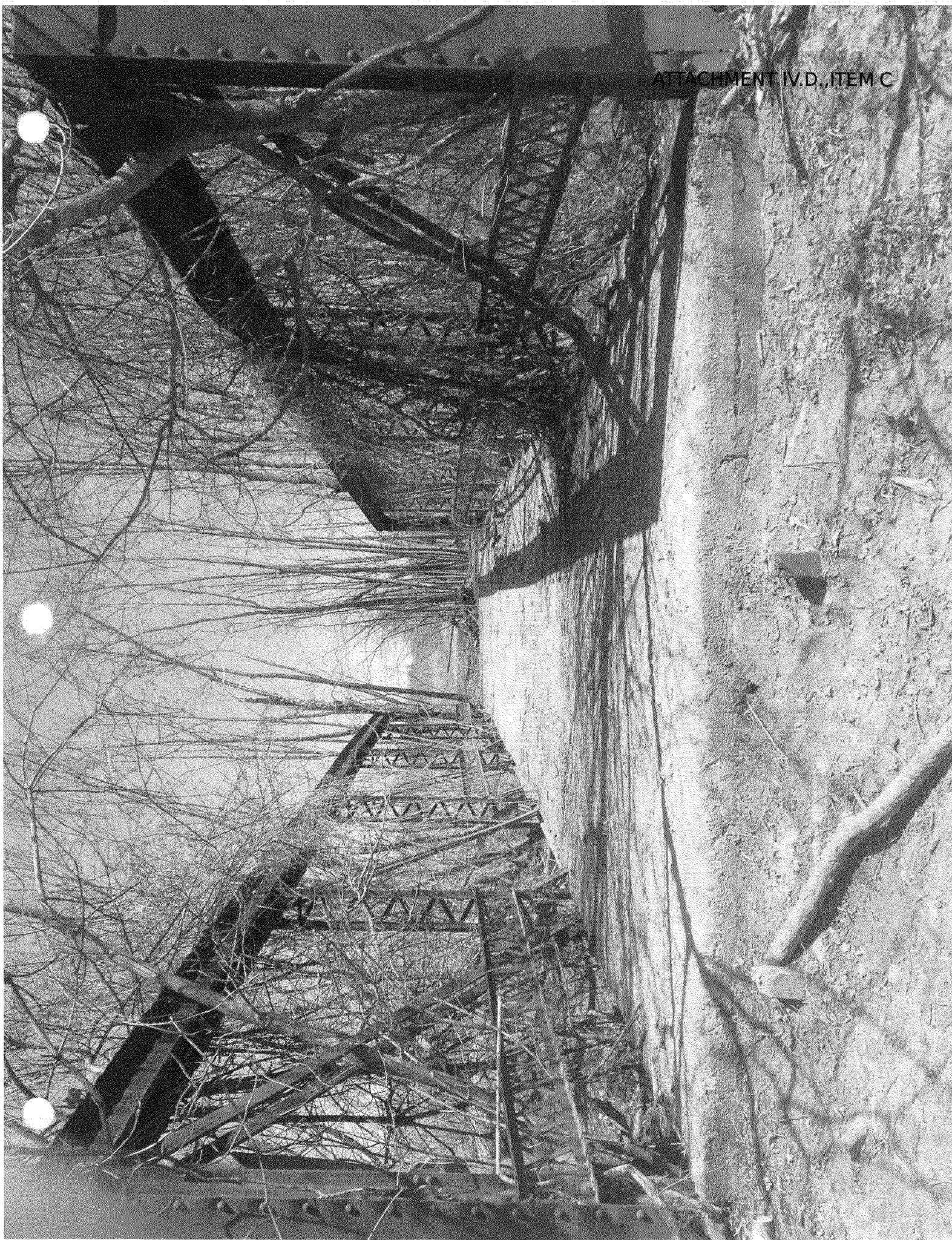
Attachment IV.D, Item E.

In the case of the existing structures used for drainage control and slurry disposal, the reclamation of these structures will be deemed successful when the following reclamation techniques are achieved. 1) the quality of the water within these structures will be within acceptable limits at the time of final bond release. The parameters to be checked at final bond release will be the normal parameters checked for an outfall in reclamation status. Any affected slopes, inlets or outlets to the structures must be stable and planted with the applicable species noted in Attachment VII.B.2.a. Post mine water levels for these structures may range from 0 feet to the pre-mine levels or above which are appropriate for this area since these levels fluctuated prior to our activities and in any event augment the surrounding wildlife land uses.

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Attachment IV.D.
Rev Date 03/20/13

The Greenbrier Road Bridge is proposed to be used as a support structure for the slurry line over Pigeon Creek. The bridge is abandoned but still a viable structure capable of supporting the weight of the slurry line. For specifics regarding the placement of the line on the bridge over Pigeon Creek, see Attachment IV.G., Item C.

ATTACHMENT IV.D, ITEM C



ATTACHMENT IV.D, ITEM C



ATTACHMENT IV.D., ITEM C





ATTACHMENT IV.D, ITEM C



ATTACHMENT IV.D, ITEM C



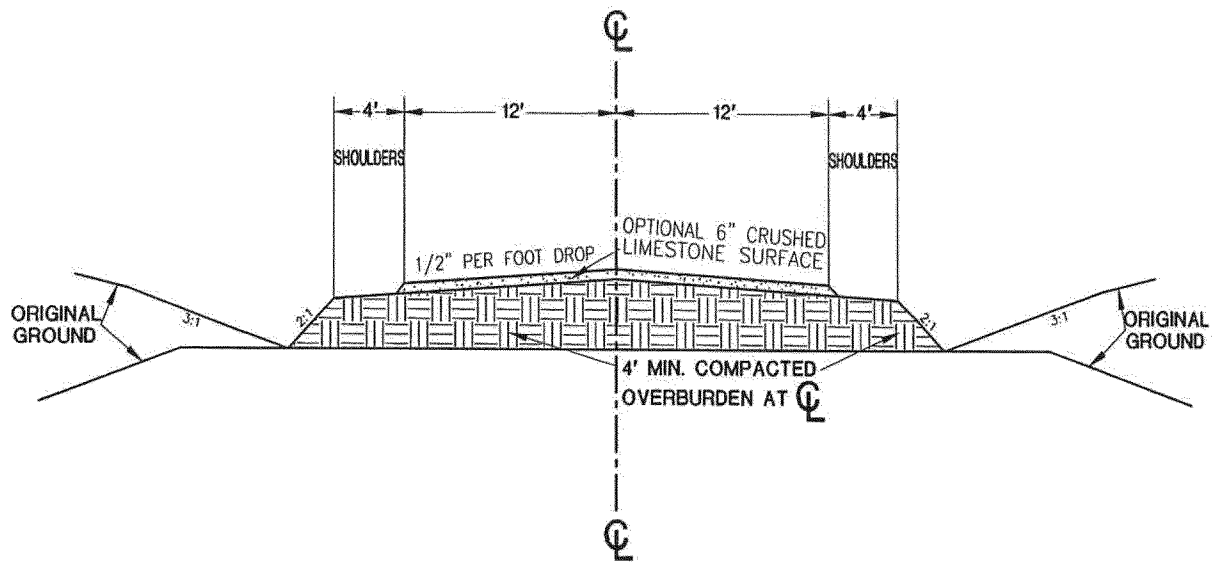


ATTACHMENT IV.D., ITEM C



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Typical Haulroad Cross-Section



Note: Haul Roads will be constructed using non-toxic, non-acid forming materials.

Seven Hills Mine
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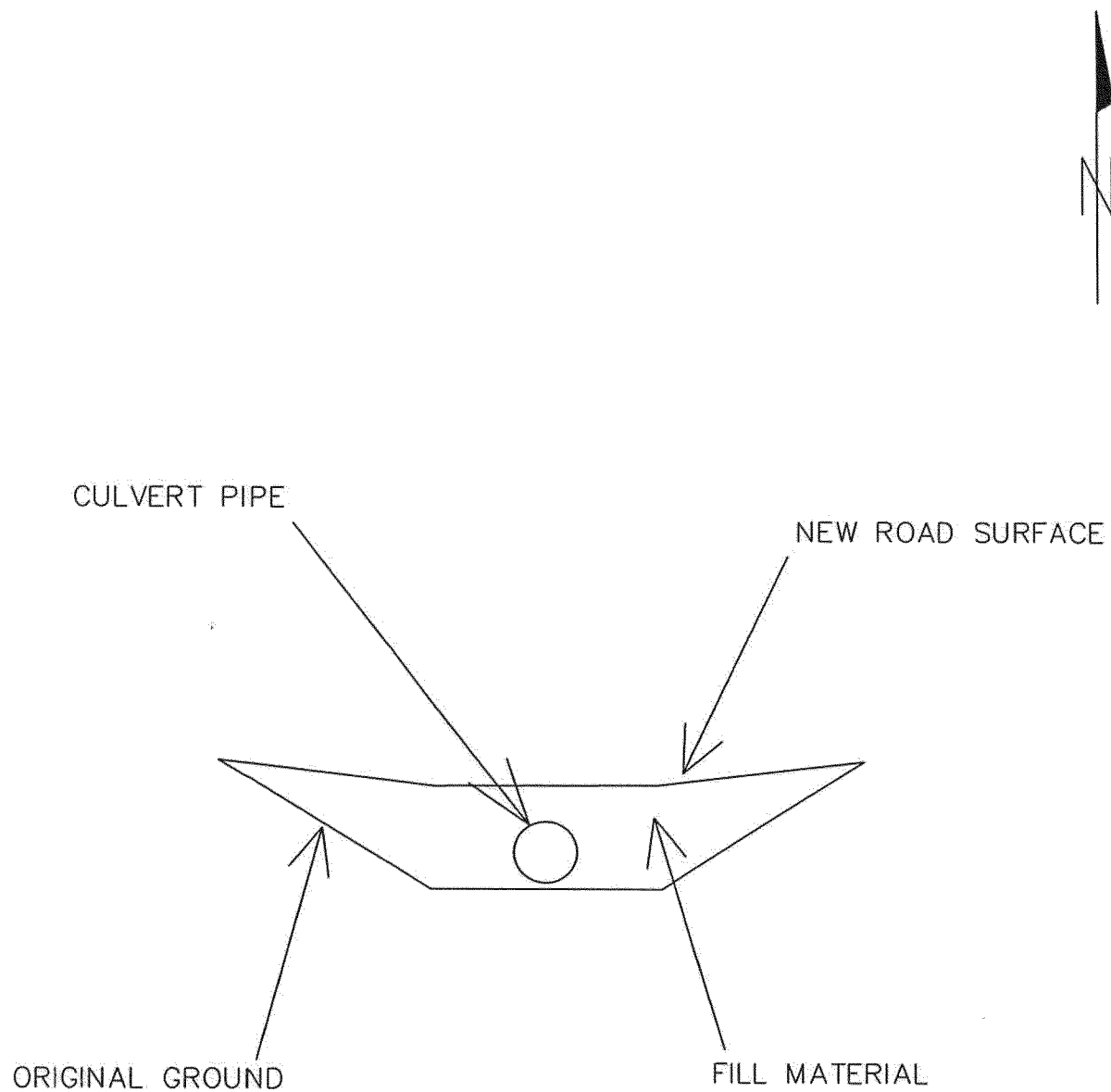
ATTACHMENT IV.E.9.e.2

CULVERT TABLE

Culvert #	Size	Length	Drainage Area	Intended Use Crossing	Permanent or Temporary
	[dia]	[ft]	[ac]		[P or T]
HR2CP 1	60 inch	150 ft	343.0	Haul Road	T
HR2CP 2	36 inch	150 ft	120.0	Haul Road	T
HR2CP 3	48 inch	150 ft	377.0	Haul Road	T
HR2CP 4	48 inch	150 ft	550.0	Haul Road	T
HR2CP 5	24 inch	150 ft	82.0	Haul Road	T
HR1CP 1*	96 inch	150 ft	900.0	Haul Road	T

*Note: See the design plans for sediment basin SB005 contained in Attachment VI.B.2.b.[2] for details regarding haul road culvert HR1CP 1. The discharge pipe of SB005 functions as the culvert pipe under the haul road.

ATTACHMENT IV.E.9.e.1

SEVEN HILLS
TYPICAL CULVERT
CROSS-SECTION

NOTE: FILL MATERIAL OVER CULVERT WILL BE NON-TOXIC, NON-COMBUSTIBLE.

DIAGRAM NOT TO SCALE

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*****
*                               HYDGRAPH  Ver 1.30                               *
*                               SCS Runoff Hydrograph Calculations                *
* (C) Copyright 1986,1988 by Richard A. Rampone, P.E. *
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August 08, 2005

Project Title : HR2CP1

Project Location : SEVEN HILLS MINE

WATERSHED ANALYSIS SUMMARY TABLE -----

Methods of Computation

Runoff Volume : Soil Conservation Service
Peak Discharge : SCS Dimensionless Unit Hydrograph

Rainfall Parameters

Rainfall Return Period = 2.00 years
Rainfall Duration = 6.00 hours
Rainfall Amount = 2.40 inches
Time Interval = .10 hours
Rainfall Distribution :
SCS Emergency Spillway and Freeboard Hydrograph

Watershed Parameters

Watershed Area = 343.00 acres
SCS Runoff Curve Number = 75.00
Time of Concentration = 1.45 hours

Rainfall - Runoff Summary

Peak Discharge = 63.30 cfs
Time to Peak = 3.80 hours
Runoff Volume = .593 inches 16.949 acre-feet

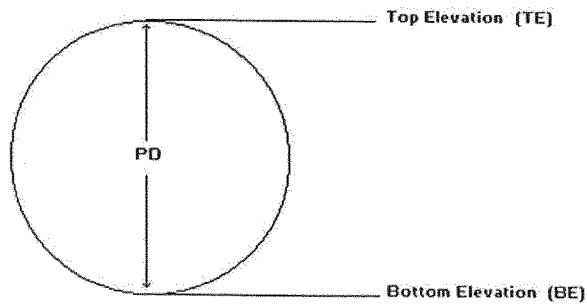
HP2CP1												
Inches Diameter	ft. Diameter	ft. Length	ft. Infall	ft. Outfall	Manning	ft. Pipe Fall	ft. Pipe Slope	sq. ft. X-Area	ft. Wetted P.	ft. H. Radius	FPS Velocity	CFS Discharge
60	5.0	150	386	384	0.020	2.00	0.0133	19.6349	15.7080	1.250	9.956	195.48
Inches Diameter	ft. Diameter	ft. Length	ft. Infall	ft. Outfall	Manning	ft. Pipe Fall	ft. Pipe Slope	sq. ft. X-Area	ft. Wetted P.	ft. H. Radius	FPS Velocity	CFS Discharge
-	-	-	0	0	0.020	-	#DIV/0!	-	-	#DIV/0!	#DIV/0!	#DIV/0!
Inches Diameter	ft. Diameter	ft. Length	ft. Infall	ft. Outfall	Manning	ft. Pipe Fall	ft. Pipe Slope	sq. ft. X-Area	ft. Wetted P.	ft. H. Radius	FPS Velocity	CFS Discharge
-	-	-	0	0	0.012	-	#DIV/0!	-	-	#DIV/0!	#DIV/0!	#DIV/0!

SPILLPIPE AND CULVERT
DISCHARGE CALCULATIONS

Spillpipe Basin N/A Pipe Infall Elevation 386 ft amsl
 Culvert No. N/A HR2CPI Pipe Outfall Elevation 384 ft amsl
 Pipe Length 150 ft Gradient (ft/ft) 0.01
 Pipe Material C.P.P. Manning Factor 0.012
 Pipe Diameter 60 in. Runoff Area 343 ac
 Peak Discharge (CFS) 195.4 cfs

Flow Calculations

Water Elev.	Flow Depth (ft)	Cross-sectional Area (ft ²)	Hydraulic Radius (ft)	Wetted Perimeter (ft)	Velocity (FPS) V	Discharge (CFS) Q
391	5.0	19.63	1.25	15.7	9.95	195.48
386	0	0	0	0	0	0



Pipe Diameter 60 In
 Pipe Material C.P.P.
 Top Elevation of Pipe (TE) 391 ft amsl
 Bottom Elevation of Pipe (BE) 386 ft amsl

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*                               HYDGRAPH  Ver 1.30                               *
*                               SCS Runoff Hydrograph Calculations                *
* (C) Copyright 1986,1988 by Richard A. Rampone, P.E. *
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August 08, 2005

Project Title : HR2CP2

Project Location : SEVEN HILLS MINE

WATERSHED ANALYSIS SUMMARY TABLE -----

Methods of Computation

Runoff Volume : Soil Conservation Service
Peak Discharge : SCS Dimensionless Unit Hydrograph

Rainfall Parameters

Rainfall Return Period = 2.00 years
Rainfall Duration = 6.00 hours
Rainfall Amount = 2.40 inches
Time Interval = .10 hours
Rainfall Distribution :
SCS Emergency Spillway and Freeboard Hydrograph

Watershed Parameters

Watershed Area = 120.00 acres
SCS Runoff Curve Number = 75.00
Time of Concentration = .85 hours

Rainfall - Runoff Summary

Peak Discharge = 28.09 cfs
Time to Peak = 3.20 hours
Runoff Volume = .593 inches 5.930 acre-feet

Sheet1

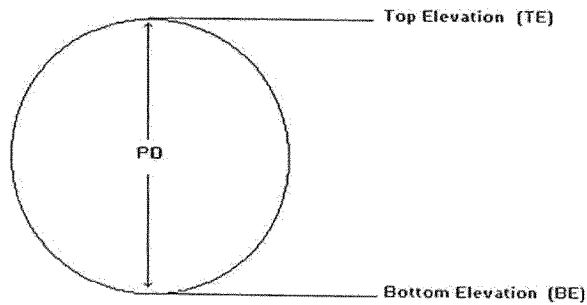
HP2CP2												
Inches Diameter	ft. Diameter	ft. Length	ft. Infall	ft. Outfall	Manning	ft. Pipe Fall	ft. Pipe Slope	sq. ft. X-Area	ft. Wetted P	ft. H-Radius	FPS Velocity	CFS Discharge
36	3.0	150	386	384	0.020	2.00	0.0133	7.0686	9.4248	0.750	7.082	50.06
Inches Diameter	ft. Diameter	ft. Length	ft. Infall	ft. Outfall	Manning	ft. Pipe Fall	ft. Pipe Slope	sq. ft. X-Area	ft. Wetted P	ft. H-Radius	FPS Velocity	CFS Discharge
-	-	-	0	0	0.020	-	#DIV/0!	-	-	#DIV/0!	#DIV/0!	#DIV/0!
Inches Diameter	ft. Diameter	ft. Length	ft. Infall	ft. Outfall	Manning	ft. Pipe Fall	ft. Pipe Slope	sq. ft. X-Area	ft. Wetted P	ft. H-Radius	FPS Velocity	CFS Discharge
-	-	-	0	0	0.012	-	#DIV/0!	-	-	#DIV/0!	#DIV/0!	#DIV/0!

SPILLPIPE AND CULVERT
DISCHARGE CALCULATIONS

Spillpipe Basin N/A Pipe Infall Elevation 386 ft amsl
 Culvert No. ~~N/A~~ HR2CP2 Pipe Outfall Elevation 384 ft amsl
 Pipe Length 150 ft Gradient (ft/ft) 0.013
 Pipe Material C.P.P. Manning Factor 0.012
 Pipe Diameter 36 In. Runoff Area 120 ac
 Peak Discharge (CFS) 50.06 cfs

Flow Calculations

Water Elev.	Flow Depth (ft)	Cross-sectional Area (ft ²)	Hydraulic Radius (ft)	Wetted Perimeter (ft)	Velocity (FPS) V	Discharge (CFS) Q
389	3.0	7.06	0.75	9.42	7.08	50.06
386	0	0	0	0	0	0



Pipe Diameter 36 In
 Pipe Material C.P.P.
 Top Elevation of Pipe (TE) 386 ft amsl
 Bottom Elevation of Pipe (BE) 384 ft amsl

```

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*                               HYDGRAPH  Ver 1.30                               *
*                               SCS Runoff Hydrograph Calculations                *
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August 08, 2005

Project Title : HR2CP3

Project Location : SEVEN HILLS MINE

WATERSHED ANALYSIS SUMMARY TABLE -----

Methods of Computation

Runoff Volume : Soil Conservation Service
Peak Discharge : SCS Dimensionless Unit Hydrograph

Rainfall Parameters

Rainfall Return Period = 2.00 years
Rainfall Duration = 6.00 hours
Rainfall Amount = 2.40 inches
Time Interval = .10 hours
Rainfall Distribution :
SCS Emergency Spillway and Freeboard Hydrograph

Watershed Parameters

Watershed Area = 377.00 acres
SCS Runoff Curve Number = 75.00
Time of Concentration = 1.45 hours

Rainfall - Runoff Summary

Peak Discharge = 69.58 cfs
Time to Peak = 3.80 hours
Runoff Volume = .593 inches 18.630 acre-feet

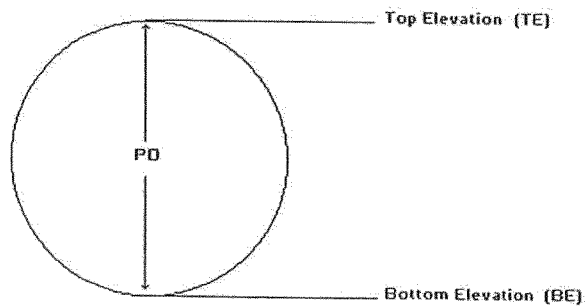
HP2CP3												
Inches Diameter	ft. Diameter	ft. Length	ft. Infall	ft. Outfall	Manning	ft. Pipe Fall	ft. Pipe Slope	sq. ft. X-Area	ft. Wetted P	ft. H. Radius	FPS Velocity	CFS Discharge
48	4.0	150	386	384	0.020	2.00	0.0133	12.5664	12.5664	1.000	8.579	107.81
Inches Diameter	ft. Diameter	ft. Length	ft. Infall	ft. Outfall	Manning	ft. Pipe Fall	ft. Pipe Slope	sq. ft. X-Area	ft. Wetted P	ft. H. Radius	FPS Velocity	CFS Discharge
-	-	-	0	0	0.020	-	#DIV/0!	-	-	#DIV/0!	#DIV/0!	#DIV/0!
Inches Diameter	ft. Diameter	ft. Length	ft. Infall	ft. Outfall	Manning	ft. Pipe Fall	ft. Pipe Slope	sq. ft. X-Area	ft. Wetted P	ft. H. Radius	FPS Velocity	CFS Discharge
-	-	-	0	0	0.012	-	#DIV/0!	-	-	#DIV/0!	#DIV/0!	#DIV/0!

SPILLPIPE AND CULVERT
DISCHARGE CALCULATIONS

Spillpipe Basin N/A Pipe Infall Elevation 386 ft amsl
 Culvert No. ~~N/A~~ HP2CP3 Pipe Outfall Elevation 384 ft amsl
 Pipe Length 150 ft Gradient (ft/ft) 0.0133
 Pipe Material C.P.P. Manning Factor 0.012
 Pipe Diameter 48 in. Runoff Area 377 ac
 Peak Discharge (CFS) 107.81

Flow Calculations

Water Elev.	Flow Depth (ft)	Cross-sectional Area (ft ²)	Hydraulic Radius (ft)	Wetted Perimeter (ft)	Velocity (FPS) V	Discharge (CFS) Q
<u>390</u>	<u>4.0</u>	<u>12.56</u>	<u>1.00</u>	<u>12.56</u>	<u>8.57</u>	<u>107.81</u>
<u>386</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>



Pipe Diameter 48 In
 Pipe Material C.P.P.
 Top Elevation of Pipe (TE) 390 ft amsl
 Bottom Elevation of Pipe (BE) 386 ft amsl

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*                               HYDGRAPH  Ver 1.30                               *
*                               SCS Runoff Hydrograph Calculations                *
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August 08, 2005

Project Title : HR2CP4

Project Location : SEVEN HILLS MINE

WATERSHED ANALYSIS SUMMARY TABLE

Methods of Computation

Runoff Volume : Soil Conservation Service
 Peak Discharge : SCS Dimensionless Unit Hydrograph

Rainfall Parameters

Rainfall Return Period = 2.00 years
 Rainfall Duration = 6.00 hours
 Rainfall Amount = 2.40 inches
 Time Interval = .10 hours
 Rainfall Distribution :
 SCS Emergency Spillway and Freeboard Hydrograph

Watershed Parameters

Watershed Area = 550.00 acres
 SCS Runoff Curve Number = 75.00
 Time of Concentration = 1.97 hours

Rainfall - Runoff Summary

Peak Discharge = 90.22 cfs
 Time to Peak = 4.30 hours
 Runoff Volume = .593 inches 27.178 acre-feet

Sheet1

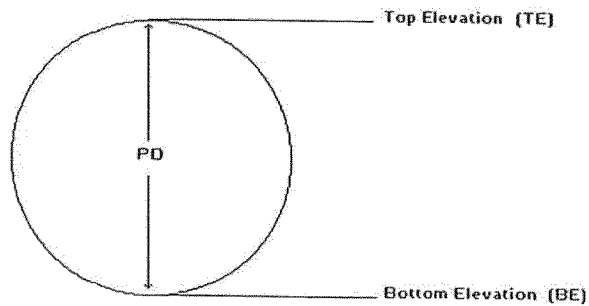
HP2CP4												
Inches Diameter	ft. Diameter	ft. Length	ft. Infall	ft. Outfall	Manning	ft. Pipe Fall	ft. Pipe Slope	sq. ft. X-Area	ft. Wetted P	ft. H. Radius	FPS Velocity	CFS Discharge
48	4.0	150	386	384	0.020	2.00	0.0133	12.5664	12.5664	1.000	8.579	107.81
Inches Diameter	ft. Diameter	ft. Length	ft. Infall	ft. Outfall	Manning	ft. Pipe Fall	ft. Pipe Slope	sq. ft. X-Area	ft. Wetted P	ft. H. Radius	FPS Velocity	CFS Discharge
-	-	-	0	0	0.020	-	#DIV/0!	-	-	#DIV/0!	#DIV/0!	#DIV/0!
Inches Diameter	ft. Diameter	ft. Length	ft. Infall	ft. Outfall	Manning	ft. Pipe Fall	ft. Pipe Slope	sq. ft. X-Area	ft. Wetted P	ft. H. Radius	FPS Velocity	CFS Discharge
-	-	-	0	0	0.012	-	#DIV/0!	-	-	#DIV/0!	#DIV/0!	#DIV/0!

SPILLPIPE AND CULVERT
DISCHARGE CALCULATIONS

Spillpipe Basin N/A Pipe Infall Elevation 386 ft amsl
 Culvert No. N/A HR2CP4 Pipe Outfall Elevation 384 ft amsl
 Pipe Length 150 ft Gradient (ft/ft) 0.013
 Pipe Material C.P.P. Manning Factor 0.012
 Pipe Diameter 48 In. Runoff Area 550 ac
 Peak Discharge (CFS) 90.22

Flow Calculations

Water Elev.	Flow Depth (ft)	Cross-sectional Area (ft ²)	Hydraulic Radius (ft)	Wetted Perimeter (ft)	Velocity (FPS) V	Discharge (CFS) Q
390	4.0	12.56	1.00	12.566	8.57	107.81
386	0	0	0	0	0	0



Pipe Diameter 48 In
 Pipe Material C.P.P.
 Top Elevation of Pipe (TE) 390 ft amsl
 Bottom Elevation of Pipe (BE) 386 ft amsl

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*                               HYDGRAPH  Ver 1.30                               *
*                               SCS Runoff Hydrograph Calculations                *
* (C) Copyright 1986,1988 by Richard A. Rampone, P.E. *
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August 08, 2005

Project Title : HR2CP5

Project Location : SEVEN HILLS MINE

WATERSHED ANALYSIS SUMMARY TABLE

Methods of Computation

Runoff Volume : Soil Conservation Service
 Peak Discharge : SCS Dimensionless Unit Hydrograph

Rainfall Parameters

Rainfall Return Period = 2.00 years
 Rainfall Duration = 6.00 hours
 Rainfall Amount = 2.40 inches
 Time Interval = .10 hours
 Rainfall Distribution :
 SCS Emergency Spillway and Freeboard Hydrograph

Watershed Parameters

Watershed Area = 82.00 acres
 SCS Runoff Curve Number = 75.00
 Time of Concentration = 1.74 hours

Rainfall - Runoff Summary

Peak Discharge = 13.93 cfs
 Time to Peak = 4.10 hours
 Runoff Volume = .593 inches 4.052 acre-feet

Sheet1

HP2CP5

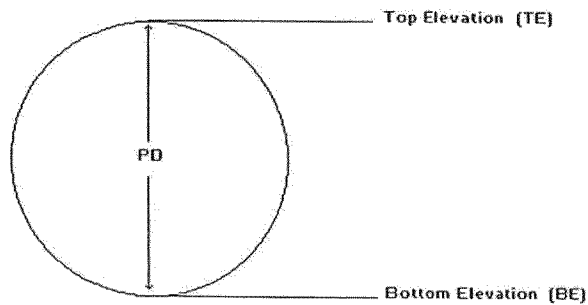
Inches Diameter	ft. Diameter	ft. Length	ft. Infall	ft. Outfall	Manning	ft. Pipe Fall	ft. Pipe Slope	Sq. ft. X-Area	ft. Wetted P.	ft. H. Radius	FPS Velocity	CFS Discharge
24	2.0	150	400	398	0.020	2.00	0.0133	3.1416	6.2832	0.500	5.405	16.98
-	-	-	0	0	0.020	-	#DIV/0!	-	-	#DIV/0!	#DIV/0!	#DIV/0!
-	-	-	0	0	0.012	-	#DIV/0!	-	-	#DIV/0!	#DIV/0!	#DIV/0!

SPILLPIPE AND CULVERT
DISCHARGE CALCULATIONS

Spillpipe Basin N/A Pipe Infall Elevation 400 ft amsl
 Culvert No. ~~HR2CR5~~ Pipe Outfall Elevation 398 ft amsl
 Pipe Length 150 ft Gradient (ft/ft) 0.013
 Pipe Material C.P.P. Manning Factor 0.012
 Pipe Diameter 24 In. Runoff Area 82.0 ac.
 Peak Discharge (CFS) 13.93 cfs

Flow Calculations

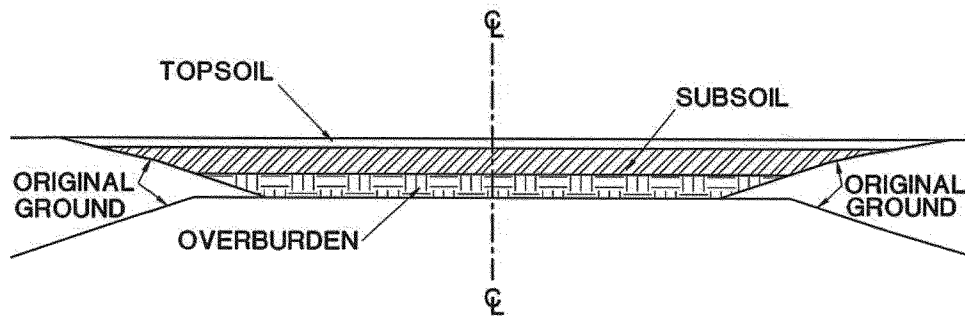
Water Elev.	Flow Depth (ft)	Cross-sectional Area (ft ²)	Hydraulic Radius (ft)	Wetted Perimeter (ft)	Velocity (FPS) V	Discharge (CFS) Q
402	2.0	3.14	0.50	6.28	5.40	16.98
400	0	0	0	0	0	0



Pipe Diameter 24 In
 Pipe Material C.P.P.
 Top Elevation of Pipe (TE) 402 ft amsl
 Bottom Elevation of Pipe (BE) 400 ft abmsl

Permit ID	S-00357
Attachment	IV.E.9.g.2
Rev Date	08/31/10

Typical Cross-Section, Reclaimed Transportation Facility



[Drawing Not To Scale]

Permit ID S-00357 Attachment IV.G Rev Date 08/31/10

Coal Processing Waste Disposal

- A. Show the location of all coal processing facilities, including slurry lines, temporary storage and waste disposal areas on the Operations Map.

See map #6

- B. Will processing waste materials derived from activities that take place outside of the permit area be disposed of within the permit area?

☐ YES ☒ NO

If yes,

1. Provide the source(s) and type(s) of the waste materials:

Coal Processing Waste Source	Coal Processing Waste Type
------------------------------	----------------------------

2. Submit, as Attachment IV.G, Item B.2, a demonstration, including hydrologic, geologic, geotechnical, physical, and chemical analyses, that the disposal will not:

- a. Adversely affect water quality, water flow or vegetation
- b. Create public health hazards, or
- c. Cause instability in the disposal area(s)

Attachment G. Item B.2.

The subject material is mainly rock with small amount of coal, and possible above average concentrations of pyrite (see attachment V.B.4). These materials will be treated as potentially toxic or acid forming material. See Part IV. F. The spoil to refuse ratio should range from 55 -70/1, thus ground water quality within the mined area will be primarily influenced by contact with the spoil. Surface water contacting refuse will be routed through sediment ponds and will be subject to N.P.D.E.S. effluent limitations. Calcium Carbonate materials with in the spoil should neutralize the effect of pyrite concentration. No damming of these materials is planned, therefore, stability questions are not applicable.

[Drawing Not To Scale]

Permit ID S-00357 Attachment IV.G Rev Date 02/19/13

Coal Processing Waste Disposal

- C. Provide plans for the disposal of coal processing wastes, handling of slurry from bleed off operations, measures to prevent combustion of the waste materials, and that ensure the stability of the disposal area:**

Make-up water for the plant will be pumped from sediment basin #SB005. Fine coal refuse will be pumped east to RB001 as depicted on Map 6. See Attachment B.2.b.[2] for RB001 design plans. Where necessary, bleed off valves will be installed in the slurry line. Sumps will be constructed at the bleed off valve locations to control any slurry discharge. At the point where the slurry line crosses Pigeon Creek, the slurry line will be encased in a second pipe. The slurry line will cross Pigeon Creek at the location of the old Greenbrier Road Bridge. Although not in use anymore for vehicle traffic, the bridge is still intact and capable of supporting the slurry line. See Attachment IV.G., Item C-1 for a diagram of the crossing. The encased slurry line would be placed on the road surface of the Greenbrier Road Bridge. Coarse coal refuse will be disposed of in the active pit and buried under at least 15 feet of non-toxic non-combustible earthen material. When possible this material will be buried in the bottom of the pit and below the water table as depicted in Attachment IV.G., Item F. Coarse coal refuse will not be stored or placed in or near a drainageway. To prevent sustained combustion, material that shows signs of combustion will be covered with a non-combustible material to limit the oxygen needed for combustion. This material will be compacted. The equipment used to handle toxic materials is included in IV.C.1.&2.

- D. Describe plans to be implemented to ensure that the disposal of coal processing wastes, including bleed off from slurry lines, will not adversely affect surface and ground water quality and quantity, or create health hazards. Include maintenance, the steps that are to be taken to prevent slurry deposition in areas other than the approved disposal areas through potential accidental discharge and the methods that will be employed to correct any accidental discharges should they occur:**

Coarse coal materials will be buried and covered with non-toxic, non-combustible earthen material no closer than 100 feet from the highwalls, endwalls or any permanent final cut impoundments. If combustion of refuse occurs, available mining equipment will be used to cover the material with spoil to extinguish the fire. Water trucks or water cannons may also be used.

Surface runoff from RB001 will be controlled through SB007 which is an NPDES outfall point. Treatment, including neutralization, where necessary, of effluent leaving basin SB007 will be conducted on an as needed basis. Monitored according to N.P.D.E.S. permit requirements will be conducted.

Slurry being pumped to RB001 will be pumped through a buried line which will minimize surface affects of the surrounding area if accidental discharged would occur. The only exception will be the crossing over Pigeon Creek. See item C. of this attachment for details regarding the slurry line/Pigeon Creek crossing. Sumps will be utilized near bleed off valves on areas where buried line cannot be used.

Slurry pipelines will be periodically visually inspected to ensure hydraulic integrity and proper function. In the event of a slurry pipeline rupture and/or spill, released material will be controlled using straw bales, slit fences, earthen berms, temporary diversions and/or sumps, and/or other available means to capture, immobilize, and contain said released material. The released slurry and affected soils will be removed for disposal as specified in Attachment IV.F. of this document. The affected area will be reclaimed for the applicable land use according to requirements specified in Part VII.

[Drawing Not To Scale]

Permit ID S-00357 Attachment IV.G Rev Date 02/19/13

Coal Processing Waste Disposal

E. Provide plans for the treatment, final grading and revegetation of the coal processing waste disposal area(s) including a schedule for the completion of each phase of reclamation:

Coarse coal refuse will typically be disposed of as depicted in Attachment IV.G, Item F. At a minimum coarse coal refuse will be covered with 15 feet of non-toxic non-combustible earthen material. Coarse coal materials will be buried and covered with non-toxic, non-combustible earthen material no closer than 100 feet from the endwalls of the pit or any permanent final cut impoundments.

Once RB001 has filled with slurry, the waste material will be covered with a minimum of eight (8) feet of water over 25% of the inundated area. Furthermore:

- Any exposed refuse will be covered with a minimum of 4 feet of nontoxic earthen material.
- Reasonable attempts will be made to push 2 to 4 feet of nontoxic earthen material over fine refuse in areas with shallow water (depth of less than 4 feet).
- Four quarterly water samples from slurry disposal cell will be taken prior to final bond release, analyzing for total iron and pH.
- A water depth profile will be submitted at bond release.
- If the 8 feet of water over 25% is not achieved, the area will be covered with a minimum of 4 feet of non-toxic earthen material.

Covering the refuse with water will minimize oxidation. [see cross-section (Attachment IV.B.2.b.(2))]. RB001 will be totally incised therefore dam stability is not an issue. If combustion of refuse occurs, available mining equipment will be used to cover the material with spoil to extinguish the fire. Water trucks or water cannons may also be used.

Once slurry disposal is completed, any required reclamation will be completed within 180 days or a grading deferral will be submitted and approved. In the event 8 feet of water cover is not achieved within a reasonable period over 25% of the slurry cell, a reclamation plan will be submitted for approval to the DOR. The approved remedial measures will be implemented during the next available reclamation season.

F. Provide, as Attachment IV.G., ITEM F, a plan view and cross-sections for each gob and slurry disposal area which accurately depict the final surface configuration of each waste disposal area and the relationship of that final surface to the surrounding surface configuration.

Coarse coal refuse will typically be disposed of as depicted in Attachment IV.B.2.b.(2). At a minimum coarse coal refuse will be covered with 15 feet of non-toxic non-combustible earthen material. See Attachment B.2.b.(2) for final surface configurations for slurry disposal cell RB001.

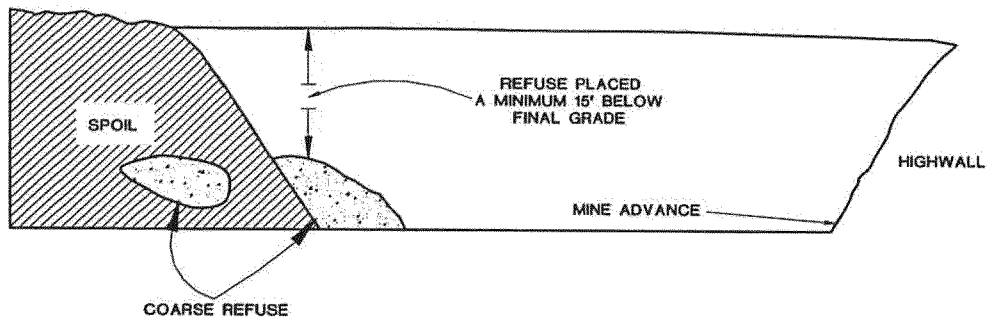
[Drawing Not To Scale]

Permit ID S-00357
Attachment IV.G
Rev Date 01/31/11

Coal Processing Waste Disposal

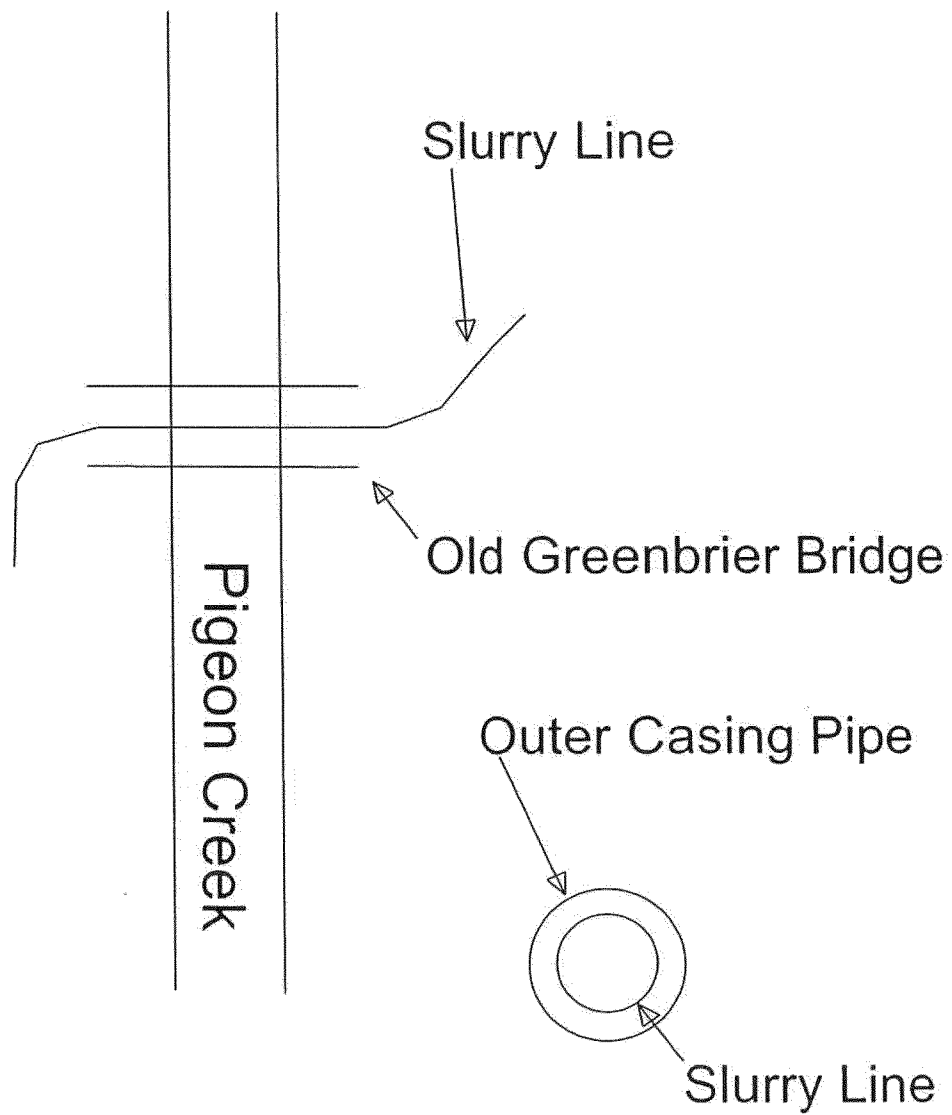
Attachment IV.G., Item F

ACTIVE PIT



[Drawing Not To Scale]

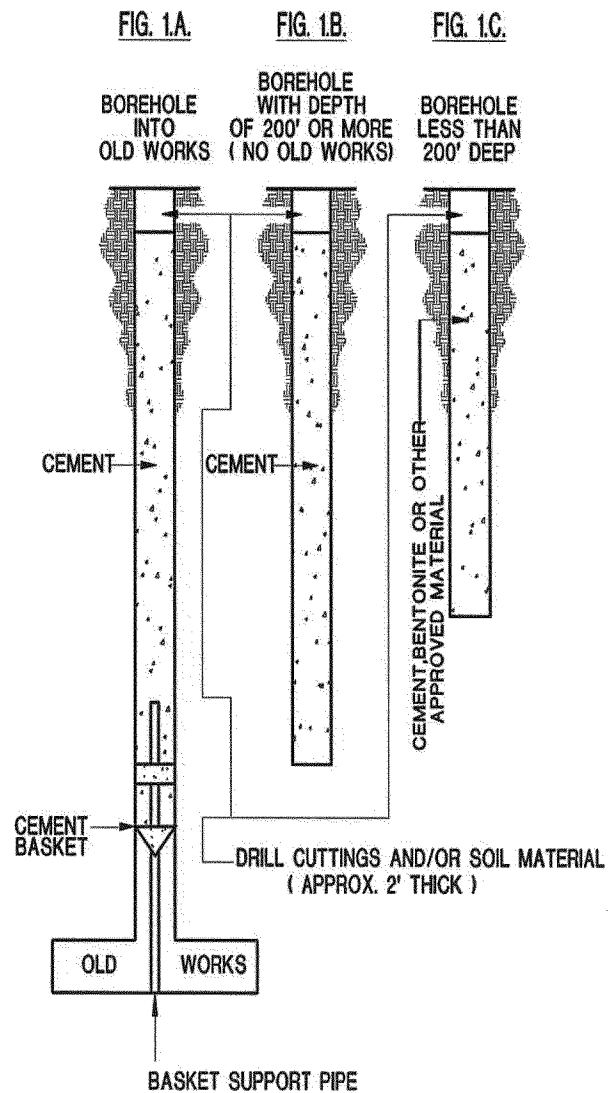
Attachment IV.G., Item C-1



Not To Scale

Permit ID S-00357
Attachment IV.H.2
Rev Date 08/31/10

Typical Cross-Section Borehole Plugging Methods



[Drawing Not To Scale]

Permit ID S-00357 Attachment IV.I Rev Date 08/31/10
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Blasting Operations

A. Ground Vibration Limits:

1. Proposed limits:

- a. For all structures in the vicinity of the blasting area, specify the maximum ground vibration limits that will not be exceeded during the blasting operations:

See Attachment IV.I, Item A.1.a.

- b. Describe the basis for the establishment of each proposed ground vibration limit:

Ground vibration limits for dwellings, public buildings, schools, churches, or community or institutional buildings are based upon maximum limitations authorized under 312 IAC 25-6-32(h)(2)(a). Ground vibration limits for all structures other than dwellings, public buildings, schools, churches, or community or institutional buildings are established based upon U.S. Bureau of Mines Bulletin No. 656 and U.S. Bureau of Mines Report of Investigation No. 8507 (1980) pages 58-60; except where specifically otherwise identified. Ground vibration limits for single pole utility structures are based upon studies conducted by Amax Coal Company, Ayrshire Mine. Ground vibration limits for buried pipelines and wells are based upon studies conducted by the U.S. Bureau of Mines and Amax Coal Company, Minnehaha Mine. Attachment IV.I, Item A.1.b provides pipeline and well specifications per the referenced study parameters. At buried communication cables ground vibration limits are based upon studies by Peabody Coal Co., Hawthorne Mine.

2. Demonstrations of Compliance:

- a. Will the scaled-distance equation, $W = (D/D_s)^2$, be used to determine the allowable charge-weight of explosives to be detonated within any 8-millisecond period?

☒ YES ☐ NO

If "YES",

- (1) Specify the scaled distance factors, D_s , that will be used to determine the allowable charge-weight at a given distance from the blast location:

See Attachment IV.I, Item A.1.a.

- (2) Are any scaled-distance factor(s), D_s , other than those contained in 310 IAC 12-5-36(h)(2)(i) proposed to determine the allowable charge-weight per delay?

☐ YES ☒ NO

If "YES", submit, as Attachment IV.I, ITEM A.2.a.2 the results of seismograph monitoring of blasting conducted at the mine site and an analysis demonstrating that the ground vibration predicted by the use of the modified scaled-distance factor(s) will not exceed the maximum peak particle velocities specified at 310 IAC 12-5-36(h)(2)(i) at a 95% confidence level.

Permit ID S-00357 Attachment IV.I Rev Date 01/31/11

Blasting Operations

- b. Will any ground vibration monitoring equipment be used?

☒ YES ☐ NO

If "YES",

- (1). Describe the monitoring equipment to be used including the types, capabilities and sensitivities (trigger levels):

See Attachment IV.I, Item A.2.b.

- (2). Provide the procedures to be used to demonstrate compliance with the proposed limits including when monitoring will occur, location of monitoring equipment, use of scaled distance factors, etc:

Blast will be monitored with a seismograph at the nearest dwelling, public building, school, church, or community or institutional building to demonstrate compliance with the maximum ground vibration limits whenever blasting occurs within 1000 feet any of these structures. Should a seismograph malfunction while being used for compliance purposes, compliance will be demonstrated through the use of the scale distance equation or through the use of regression analysis for that applicable PPV. The instruments utilized for monitoring ground vibration will be placed at the nearest uncontrolled structure for those blasts where monitoring is employed. The seismographic equipment utilized will monitor both airblast and ground vibration levels. Seismographic equipment will be returned to the factory annually for laboratory recalibration. Certification records are retained accordingly.

B. Airblast:

1. Proposed Limits:

- a. Specify the maximum airblast limit that will not be exceeded during blasting operations at any dwelling, public building, school, church, or community or institutional building:

See Attachment IV.I, Item A.1.a.

- b. Describe the basis used for the establishment of the proposed airblast limit:

312 IAC 25-6-32(e)(1).

2. Describe the monitoring equipment to be used, including types, capabilities and sensitivities (trigger levels), to monitor airblast if sufficient information was not included in Part A.2.b of this attachment:

See Attachment IV.I, Item A.2.b.

Permit ID S-00357 Attachment IV.I Rev Date 01/31/11

Blasting Operations

3. Provide the procedures to be used to demonstrate compliance with the proposed airblast limits including the when monitoring will occur, location of monitoring equipment, etc.:

Air blasts will be monitored once per calendar quarter. The monitoring period will cover seven consecutive blasts or all blasts within one week, whichever gives the most readings. The instruments utilized for monitoring air blast will be placed at the nearest dwelling, public building, school, church, or community or institutional building for which air blast limits apply. The seismographic equipment utilized will monitor airblast levels. Seismographic equipment will be returned to the factory annually for laboratory recalibration. Certification records are retained accordingly.

- C. Is a waiver of the maximum airblast and/or ground vibration limits of 312 IAC 25-6-32(i)(2) at any dwellings owned by the applicant and leased to another party requested?

☐ YES ☒ NO

If "YES", submit a written waiver signed by the lessee relieving the applicant from meeting the maximum airblast and/or ground vibration limits as Attachment IV.I, Item C.

A waiver will be submitted for structure #28-02 prior to waiving the limits.

- D. Describe the methods and techniques to be used in the blasting operations to control adverse effects of blasting operations including flyrock, ground vibration and airblast:

The use of stemming, delay design, and analyzing the overburden to be blasted help to control some of the adverse effects of the blasting operations. The certified blaster also keeps current weather information available. If adverse weather conditions arise, shots could be delayed until such conditions improve. The control of the pounds of explosives per delay and the monitoring of such shots by the use of a seismograph ensure that the maximum peak particle velocity does not exceed the limits specified above. The results of the seismic monitoring can also be used to adjust to different blasting conditions. Other safety measures to be taken include barricading access to the blasting area and using audible warning signals before detonation and after it has been determined that all blast holes were discharged. Blast holes that contain water will be detonated as soon as possible after loading. Adequate stemming will be used for all blast holes and all detonating cord will be covered. All blasting will be conducted using acceptable blasting procedures and practices with regard to hole spacing, power ratio, explosive types and weights.

- E. Describe the blast warning signals, all-clear signals to be used, manner in which all individuals living within ½ mile of the blasting area will be notified of the meaning of those signals and measures to be undertaken to control site access to protect the public and livestock. Also provide the measures to be implemented to ensure that access by livestock and unauthorized personnel is controlled until the permittee has made the determinations required at 310 IAC 12-5-36(d):

Access roads, county roads, and public highways leading into the blasting area will be barricaded to unauthorized persons by company employees in vehicles before, during and following each shot until the all clear signal is sounded. Employees will be in contact with the blasting supervisor via 2-way radios. One minute before blasting a siren will be sounded one (1) time. The siren in use will have an audible range of one half mile. All areas adjacent to the blast site will be visually inspected before the blast. A final check by the shooter will be made seconds before the shot is detonated. Areas adjacent to the blasting site will be checked for men, equipment, livestock, etc. After the blast, the area will be inspected for burning and/or undetonated explosives by the blasting foreman. Following the inspection, three short siren blasts will signal that the blast area is all clear. In the event of an unscheduled blast, all persons within one half [½] mile of the blasting area will be notified using audible warning signals. The blasting schedule, which includes the meaning of blast warning and all-clear signals and measures to be undertaken to control site access to protect the

Permit ID S-00357 Attachment IV.1 Rev Date 01/31/11
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Blasting Operations

public and livestock, will be distributed to local government and public utilities and by mail to each residence within one half [½] mile of the blasting area.

- F. 1. Is blasting to be conducted within 500 feet, measured horizontally, of an active or abandoned underground mine?**

☒ YES ☐ NO

- 2. Is blasting to be conducted within 1000 feet, measured horizontally, of any dwelling, school, church, or public or institutional building not owned by the permittee?**

☒ YES ☐ NO

- 3. If the response to either F.1 or F.2 is "YES", an Application for Blast Design Approval, completed on the Department's forms, must be submitted as Attachment IV.I, Item F.3.**

See Attachment IV.I, Item F.

- G. Provide an accurate copy of the blasting record to be completed after each blast in accordance with 312 IAC 25-4-42(5) as Attachment IV.I, ITEM G.**

See Attachment IV.I, Item G. for a copy of the blast record. Blast records will be maintained at the mine site for a period of 3 years unless the mine closes prior to 3 years. In that case the records will be maintained in our Huntingburg Office, located at 409 Van Buren Street, Huntingburg, IN 47542.

- H. Is blasting to be conducted within 60 days of the effective date of this permit?**

☒ YES ☐ NO

If "YES", provide a copy of the blasting schedule to be published and distributed in accordance with 310 IAC 12-5-35 as Attachment IV.I, ITEM H.

See Attachment IV.I, Item H.

- I. Describe the method(s) to be used to distribute the blasting schedule to IDOR, local governments, public utilities, and each resident within ½ mile of the blasting area:**

The blasting schedule will be distributed to IDOR, local governments, public utilities and each residence within one half [½] mile of the blasting area either by hand and in the presence of two company representatives or by mail.

- J. Show the proposed location for each explosive storage facility to be used in this operation on the Operations Map.**

No explosive storage is proposed.

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Blasting Operations

- K. Describe the method(s) to be used to notify all residents or owners of dwellings or structures located within one-half (½) mile of the permit area of the procedures for requesting a pre-blast survey. Identify the location where this information and a listing of those notified will be maintained and made available to DOR, and the procedures to be used to report the result of a pre-blast survey to DOR:**

United Minerals Company, LLC will notify, in writing, all residents or owners of dwellings or other structures located within one-half [½] mile of the permit area how to request a preblasting survey. United Minerals Company, LLC will notify the public, by publication at least once a week for four consecutive weeks in a local newspaper of general circulation in the county in which the blasting will occur, that they will conduct a preblasting survey upon the request by a resident or owner of a man made dwelling or structure within one (1) mile of any portion of the permit area. Preblast survey notification information will be maintained and made available to the IDoR at the United Minerals Company Offices in Huntingburg, IN, during normal business hours on Mondays thru Fridays. The results of preblast surveys will be reported to the IDoR in accordance with 312 IAC 25-6-30 [e].

Permit ID S-00357 Attachment IV.I, A.1.a Rev Date 08/31/10

**Blasting Operations
Blast Limit Information**

Protected Structures	Ground Vibration Limits			Air Blast Limits	
	Distance	Scale Distance Factor [D _s]	PPV	Low Frequency Limits	Maximum Limits
Dwelling, public building, school, church, or community or institutional building.	0 - 300'	50	1.25 in/sec	0.1 Hz or lower [Flat Response]or	134 dB peak
	301' - 5,000'	55	1.00 in/sec	2.0 Hz or lower [Flat Response]or	133 dB peak
	> 5,000'	65	0.75 in/sec	6.0 Hz or lower [Flat Response]	129 dB peak
Single pole utility structure.	-	18	9.00 in/sec	-	-
Buried electric/fiber optic cable.	-	18	9.00 in/sec	-	-
Buried transmission pipeline or well.	-	25	5.00 in/sec	-	-
All other structures.	-	40	2.00 in/sec	-	-

- ± 3 dB points

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Blasting Operations
Pipeline & Well Specifications

Elberfeld Water Co [6"]

This pipeline is a 6.0" O.D. plastic pipeline of Schedule SDR-21 PVC pipe, with a wall thickness of .410". The pipeline carries water at a maximum operating pressure of 200psi.

Elberfeld Water Co [3"]

This pipeline is a 3.0" O.D. plastic pipeline of Schedule SDR-21 PVC pipe, with a wall thickness of .410". The pipeline carries water at a maximum operating pressure of 200psi.

Permit ID S-00357 Attachment IV.I, A.2.b Rev Date 08/31/10

Blasting Operations
Blast Monitoring Equipment Information

Monitoring Equipment	Equipment Capability		Equipment Sensitivity	
	Ground Vibration	Air Blast	Ground Vibration	Air Blast
Dallas Instruments ST-4 or Equivalent Model	1 - 200 Hz \pm 3 dB	5 - 200 Hz \pm 3 dB 2 - 200 Hz \pm 3 dB	0.02 - 8.00 in/sec	100 - 140 dB Flat
Dallas Instruments ST-4D or Equivalent Model	1 - 200 Hz \pm 3 dB	5 - 200 Hz \pm 3 dB 2 - 200 Hz \pm 3 dB	0.02 - 5.12 in/sec	100 - 137 dB Flat
Digital Vibration Inc "Tele-Blast"	5 - 200 Hz	6 - 200 Hz	0.00 - 10.00 in/sec	89 - 140 dB Flat
Vibratech "Digital Everlert Vibra-Tape" 5000	2 - 200 Hz \pm 3 dB	5 - 500 Hz \pm 3 dB	0.00 - 4.00 in/sec	100 - 150 dB Flat
Vibrotech GMS 2	2 - 200 Hz \pm 3 dB	5 - 200 Hz \pm 3 dB 2 - 200 Hz \pm 3 dB	0.00 - 4.00 in/sec	100 - 150 dB Flat
White Alpha/Seis III or Equivalent Model	2 - 200 Hz \pm 3 dB	5 - 200 Hz \pm 3 dB 2 - 200 Hz \pm 3 dB	0.02 - 10.00 in/sec	106 - 140 dB
White AR-2	NA	5 - 2,000 Hz \pm 3 dB	NA	100 - 140 dB Flat

- Note:
1. Should monitoring equipment not be capable of acoustic triggering, then the seismic trigger will be set at a sufficiently low level to assure a recording of air blast is obtained.
 2. Monitoring for approved ground vibrations at 9 in/sec PPV will be conducted utilizing equipment with accelerometers.

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**Blasting Operations
Blast Design**

- A. 1. Identify the dwellings, churches, public buildings, community or institutional buildings, and school(s) located within 1000 feet and any active or abandoned underground mines within 500 feet of any location where blasting will occur. For abandoned underground mines, supply the company, mine name, and coal seam(s) mined:

Attachment II.H.3 identifies dwellings, churches, public buildings, community or institutional buildings, and schools within 1000' of the permit area.

2. Show the locations or boundaries of each dwelling, church, school and underground mine listed above on a map:

See Map 2, Identification of Interests Map and Map 4, Environmental Resources [Hydro-geologic Information] Map.

- B. Will blasting be conducted within 500 feet of an active underground mine?

[] YES [X] NO

If "YES", provide the underground mine name, IDNR Permit #, MSHA #, and coal seam(s) mined by the underground operation and attach copies of approval for the operations from the Indiana Bureau of Mines and MSHA:

UG Mine Name	IDNR Permit ID	MSHA ID	Coal Seam
--------------	----------------	---------	-----------

MSHA Approvals - Attachment _____

- C. Describe the blasting operations that will occur within 1000 feet of structures or schools or within 500 feet of active or abandoned underground mines including the nature of the overburden subject to blasting, the number and depth of coal seams to be mined, the identity of the coal seams to be mined, the presence or absence of parting(s) between coal seams, if blasting will be used to fragment partings:

Blasting operations conducted within 1000 feet of structures or schools or within 500 feet of the Ingle Coal Corp., Ditney Hill Mine will involve the use of explosives to effect fragmentation in both overburden and interburden materials. The overburden and interburden materials consist of shales and sandstones, with the presence of some limestones. Coal seams to be mined include the IN #V, IN VI and IN VII, with the IN #V coal seam averaging approximately 128'.

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Blasting Operations
Blast Design

- D. Will methods other than those indicated in Attachment IV.I.B.3. be used to ensure compliance with the maximum ground vibration and airblast limits established in 310 IAC 12-5-36(e) and (h) when blasting within 1000 feet of structures or schools, or within 500 feet of active or abandoned underground mines?

[] YES [X] NO

If "YES", provide a detailed description of the methods to be used including equipment, equipment placement, etc.:

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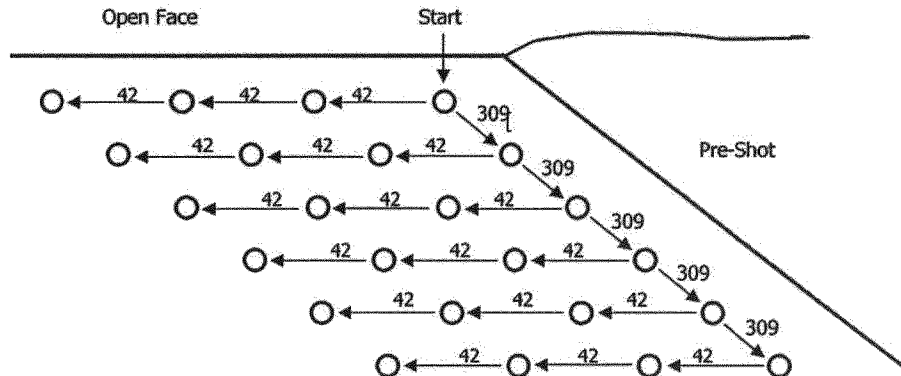
Blasting Operations Blast Design

- E 1. Provide the following information concerning the typical blast designs to be used when blasting within 1000 feet of dwellings, public buildings, schools, churches, community or institutional buildings, or within 500 feet of active or abandoned underground mines. If more than one design is to be used, supply information for each design through the completion and attachment of additional copies of the appropriate page(s):

This design is to be used 1000' to nearest dwelling, public building, school, church or institutional building.

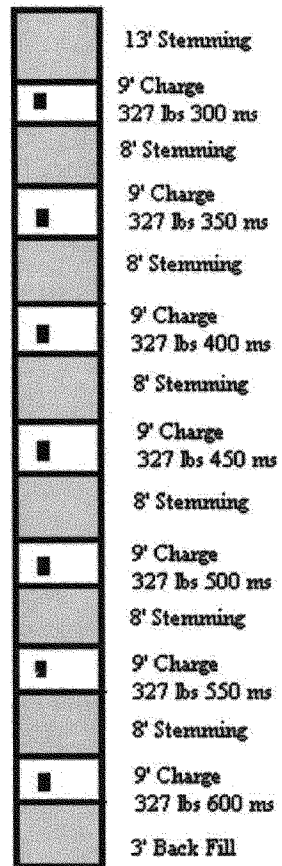
1. Interburden:

- | | |
|---|-------------------------------------|
| a. Drillhole Diameter | 9" |
| b. Explosive Diameter | 9" |
| c. Average Anticipated Hole Depth | 127' |
| d. Type and Density of Blasting Agent | ANFO/emulsion blend @
1.32 gg/cc |
| e. Surface Initiation System | Nonel |
| f. Downhole Initiation System | Nonel system or cord |
| with delay | |
| g. Typical Burden | 20' |
| h. Typical Spacing | 26' |
| i. Typical Length of Stemming | 14' |
| j. Typical Amount of Explosives Used per Hole | 2296 lbs |
| k. Attach a sketch that illustrates the type of drilling pattern to be used (square, staggered, etc.), pattern geometry, surface delays, locations of free faces, start holes and any other pertinent information. If a sequential timer is to be used, provide the timer setting to be established for the design. | |
| 1. Attach a sketch of the typical blast hole profile when fully loaded | |
| that shows the location and depth of stemming, downhole delays, length (thickness) of each dirt deck, backfill, and the typical maximum charge weight for each explosive deck. | |



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**Blasting Operations
Blast Design**



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**Blasting Operations
Blast Design**

- E 2. Provide the following information concerning the typical blast designs to be used when blasting within 1000 feet of dwellings, public buildings, schools, churches, community or institutional buildings, or within 500 feet of active or abandoned underground mines. If more than one design is to be used, supply information for each design through the completion and attachment of additional copies of the appropriate page(s):

This design is to be used within 500' of protected structures

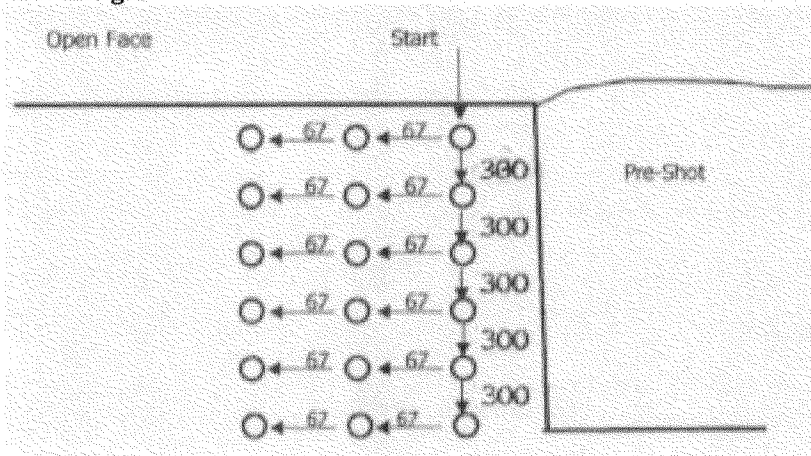
2. Parting:

- | | |
|---|---------------------------------|
| a. Drillhole Diameter | 7 7/8" |
| b. Explosive Diameter | 7 7/8" |
| c. Average Anticipated Hole Depth | 127' |
| d. Type and Density of Blasting Agent | ANFO @ .85 gg/cc |
| e. Surface Initiation System | Nonel |
| f. Downhole Initiation System | Nonel system or cord with delay |
| g. Typical Burden | 14' |
| h. Typical Spacing | 14' |
| i. Typical Length of Stemming | 10' |
| j. Typical Amount of Explosives Used per Hole | 876 lbs |
| k. Attach a sketch that illustrates the type of drilling pattern to be used (square, staggered, etc.), pattern geometry, surface delays, locations of free faces, start holes and any other pertinent information. If a sequential timer is to be used, provide the timer setting to be established for the design. | |
| l. Attach a sketch of the typical blast hole profile when fully loaded that shows the location and depth of stemming, downhole delays, length (thickness) of each dirt deck, backfill, and the typical maximum charge weight for each explosive deck. | |

[Drawing Not To Scale]

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Blasting Operations
Blast Design



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Blasting Operations Blast Design

		10' Stemming
4' Charge 73 lbs 375 ms	□	
4' Charge 73 lbs 400 ms	□	6' Stemming
4' Charge 73 lbs 425 ms	□	6' Stemming
4' Charge 73 lbs 450 ms	□	6' Stemming
4' Charge 73 lbs 475 ms	□	6' Stemming
4' Charge 73 lbs 500 ms	□	6' Stemming
4' Charge 73 lbs 525 ms	□	6' Stemming
4' Charge 73 lbs 550 ms	□	6' Stemming
4' Charge 73 lbs 575 ms	□	6' Stemming
4' Charge 73 lbs 600 ms	□	6' Stemming
4' Charge 73 lbs 625 ms	□	6' Stemming
4' Charge 73 lbs 650 ms	□	6' Stemming
		3' Back Fill

Permit ID S-00357 Attachment IV.I, F Rev Date 08/31/10

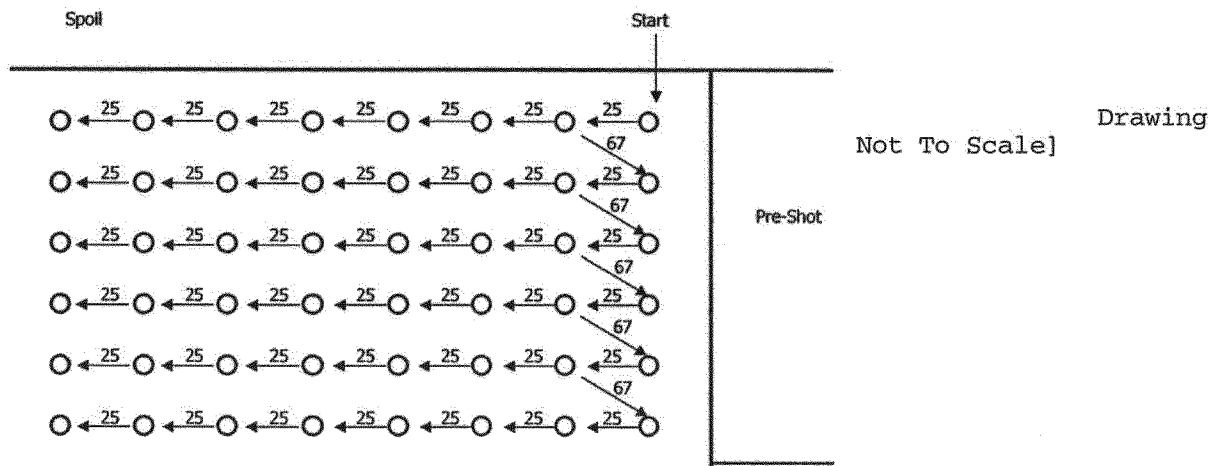
Blasting Operations
Blast Design

- E 3.** Provide the following information concerning the typical blast designs to Be used when blasting within 1000 feet of dwellings, public buildings, schools, churches, community or institutional buildings, or within 500 feet of active or abandoned underground mines. If more than one design is to be used, supply information for each design through the completion and attachment of additional copies of the appropriate page(s):

This design is to be used within 1000' of protected structures

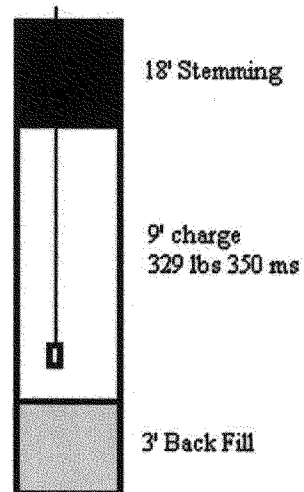
2. Shallow Parting:

- | | |
|---|---------------------------------|
| a. Drillhole Diameter | 9" |
| b. Explosive Diameter | 9" |
| c. Average Anticipated Hole Depth | 30' |
| d. Type and Density of Blasting Agent | ANFO/emulsion @ 1.32 gg/cc |
| e. Surface Initiation System | Nonel |
| f. Downhole Initiation System | Nonel system or cord with delay |
| g. Typical Burden | 17' |
| h. Typical Spacing | 20' |
| i. Typical Length of Stemming | 18' |
| j. Typical Amount of Explosives Used per Hole | 327 lbs |
| k. Attach a sketch that illustrates the type of drilling pattern to be used (square, staggered, etc.), pattern geometry, surface delays, locations of free faces, start holes and any other pertinent information. If a sequential timer is to be used, provide the timer setting to be established for the design. | |
| l. Attach a sketch of the typical blast hole profile when fully loaded that shows the location and depth of stemming, downhole delays, length (thickness) of each dirt deck, backfill, and the typical maximum charge weight for each explosive deck. | |



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**Blasting Operations
Blast Design**



3. Attach a discussion of variations on the typical design factors to be used to control adverse effects of ground vibration, airblast and flyrock.

The blast pattern will be designed to maximize rock breakage and minimize excess ground vibration and airblast. The maximum weight of explosives per delay will change as blasting moves closer or further from protected structures. The amount of explosives and/or the density of the blasting agent will be adjusted as needed to reduce off-site ground vibration and airblast. Patterns types, hole diameter, explosive diameter, burden, spacing, length of stemming and timing of shots, all may vary as needed to accommodate changes in blasting safety, unexpected geological conditions or to assure compliance with applicable blasting limitations.

Overburden patterns and timing sequences may require a variation as the drilling and shooting approaches protected structures. Variations will also be needed to deal with changes in overburden depth and geological structure. All blast design variations will calculate the maximum pounds per delay of explosives by using the scaled distance formula. Any variations from these typical designs will be made by the certified blaster based on field conditions.

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Blasting Operations
Blast Design

F. Certification of Blast Design Information:

I hereby certify and affirm that the blast designs submitted in this Application for Blast Design Approval were prepared in accordance with 310 IAC 12-5-33(e)(4) and, to the best of my knowledge and belief, present an accurate representation of the typical designs to be used for the blasting operations for which this plan is submitted.

Christopher Olinger
Printed Name of Certified Blaster

Christopher Olinger
Signature

1N041
Certification Number

UNITED MINERALS CO. LLC

409 North Van Buren, Huntingburg, Indiana 47542
Blasting Record IDNR Permit No. S-357

Date of Blast ____/____/____ Time of Blast ____ ☐ a.m. ☐ p.m. Shot No. _____

Blast Location _____ Coordinates N _____ E _____

Compliance Structures:

Primary _____ Distance and Direction from Blast _____

Secondary _____ Distance and Direction from Blast _____

Other(s) _____ Distance and Direction from Blast _____

Weather Conditions: _____

Temperature ____ °F Wind Direction _____ Speed _____ mph

Blast Design: ☐ Overburden ☐ Parting Type(s) of Material Blasted _____

No. Of Holes ____ Burden ____ Spacing ____ Depth (include range) _____ Hole Diameter _____

Stemming Length (include range) _____ Were Blasting Mats Used? ☐ Yes ☐ No

Type of Stemming; ☐ Drill Cuttings ☐ Crushed Stone ☐ Sand ☐ Clay ☐ Other _____

No. of Delayed Charges per Hole _____ Max. Charge Weight per 8 MS Delay _____ lb.

Max. Charge Weight per Hole _____ lb. Total Weight of Explosives Used _____ lb.

Explosives Information: ☐ ANFO ☐ Emulsion Blend ____/____ Loading Density (lb./ft.) _____

☐ Slurry/Water Gel Type _____ ☐ Bulk ☐ Packaged Loading Density (lb./ft.) _____

Type of Delay Detonators; In Hole _____ Surface _____

Delay Periods Used; In Hole _____ Surface _____

Type of Primer _____ ☐ 8 oz. ☐ 12 oz. ☐ 16 oz. 32 oz. ☐ Other _____

Method of Initiation ☐ Noiseless Lead In Line ☐ Electric Blasting Cap ☐ Other _____

Seismic and Airblast Data: ☐ Quarterly Series ☐ Waive Scale Distance ☐ Use OSM Blast Level Chart

Monitoring Location _____ Coordinates N _____ E _____

Distance and Direction from Blast _____ Type of Instrument _____

Trigger Levels _____ I.P.S. _____ dB Peak Particle Velocity _____ I.P.S. Airblast _____ dB

Recorder I.D. _____ Calibration Date ____/____/____ Event No. _____ ☐ Waive Form Attached

Name of Person and Firm Monitoring Blast _____

Name of Person and Firm Analyzing Blast _____

Blaster In Charge _____ License No. IN _____

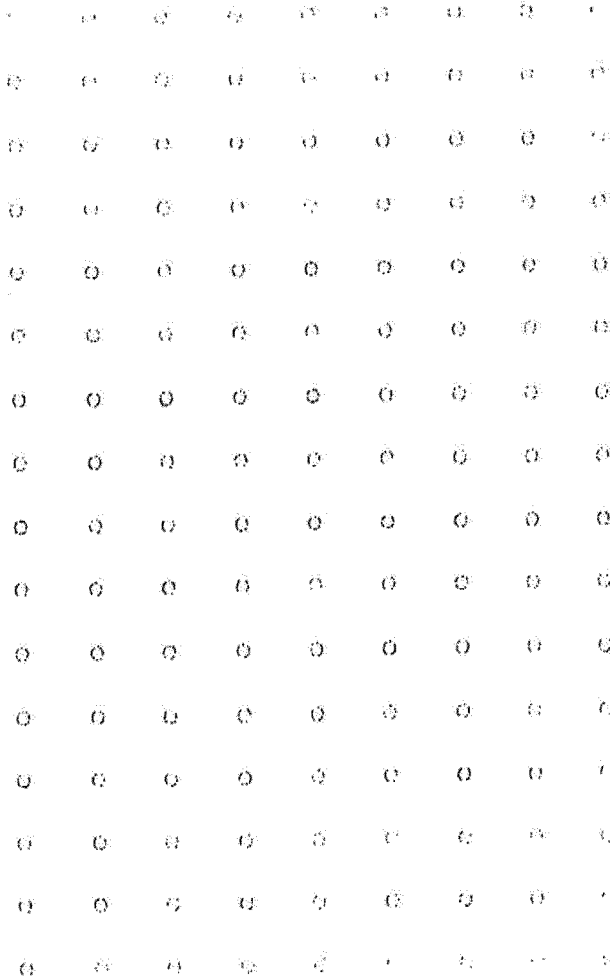
Signature _____

Permit ID S-00357 Attachment IV.I, G Rev Date 08/31/10
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**Blasting Operations
Blast Record Form**



Max. Charge Profile



Stemming ____ ft.

Column ____ ft.

Weight ____ lbs.

Primer ____ lbs.

Backfill ____ ft.

Total Depth ____ ft.

Reasons and Conditions for Unscheduled Blast: _____

Additional Comments or Explanations: _____

Permit ID S-357 Attachment IV.I, H Rev Date 01/31/11
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**Blasting Operations
Blast Schedule**

BLAST SCHEDULE NOTICE

In accordance with Indiana Code 312-IAC-25-6-31, United Minerals Company, LLC hereby provides public notice of a planned blasting schedule for the Seven Hills Mine, Permit #S-357, located 1 and ½ miles Northeast of the intersection of New Harmony Road and County Road 950 West near the old town of Millersburg, in Warrick County, Indiana.

1. **BLASTING AREA.** The area is located along the North side of New Harmony Road and along the East side of County Road 950 West, near the old town of Millersburg, Indiana. The permit area consists of 2351.2 acres is located on the Lynnville, Daylight, Elberfeld and Boonville quadrangles. The permit area is more specifically described as follows: Parts of the SW1/4 of the SE1/4, Section 27; also, the N1/2 of the SE1/4, parts of the SE1/4 of the SE1/4, parts of the NE1/4 of the SW1/4 of the SE1/4, in Section 28; also, the E1/2 of the NE1/4, Section 33; also, the W1/2 and parts of the E1/2, in Section 34; also, parts of the S1/2 of the S1/2 of the S1/2, in Section 35; all in T4S, R9W. Also, parts of the W1/2 of the W1/2 of the W1/2, in Section 1; also, parts of the E1/2 and parts of the E1/2 of the SW1/4, parts of the S1/2 of the NW1/4, in Section 2; also, the W1/2, parts of the S1/2 of the SE1/4 of the NE1/4 and the W1/2 of the E1/2, in Section 3; also, parts of the E1/2 of the SE1/4 of the NE1/4, Section 4; also, parts of the NW1/4, parts of the E1/2 of the SW1/4, parts of the W1/2 of the NE1/4 and parts of the SE1/4, in Section 10; also, the NE1/4, the E1/2 of the SE1/4, parts of the N1/2 of the SW1/4 and parts of the N1/2 of the NW1/4 of the SE1/4, in Section 11; also parts of the W1/2 of the W1/2, in Section 12; all in T5S, R9W, Warrick County, Indiana.

2. **DATES & TIMES.** Commencing on September 1, 2011 and ending on August 31, 2012, blasting may be conducted daily from sunrise to sunset per prevailing local time.

3. **ACCESS CONTROL.** The permit area is identified by signs at each access road and by markers along the perimeter. The blasting area is also marked at each point of access by a sign reading "BLASTING AREA" which explains the "BLASTING WARNING" signal and the "ALL CLEAR" signal. All access to the immediate area of the detonation is controlled by mine personnel before, during and after the detonation up until the "ALL CLEAR" signal is sounded. All areas containing charged holes are marked, posted, barricaded, flagged or guarded against unauthorized entry.

4. **AUDIBLE WARNING SIGNALS.** Warning signals consist of the "BLASTING WARNING" signal which is 1 long siren blast 1 minute prior to detonation and the "ALL CLEAR" signal which is 3 short siren blasts indicating that the blasting area is all clear.

5. **EMERGENCY DETONATIONS.** Unavoidable hazardous conditions may arise which mandate deviations from the blasting schedule. These are discretionary judgements made by the Certified Blaster in charge in the field. All conditions that may be life endangering to the public or the work force are not foreseeable. Some of these conditions include, but are not limited to, lightning, potential land or rock slides, highwall instabilities, flooding, etc.

6. **NOTICE OF RESCHEDULING BLASTING.** Before blasting in areas or at times not in a previous published schedule, a revised schedule shall be published at least 10 days, but not more than 30 days, prior to commencing blasting activities.

7. **PRE-BLAST SURVEYS.** Residents or owners of dwellings or structures within one mile of the permit area may request that a pre-blast survey be conducted on their dwelling or structures. Written requests for a survey should be submitted to either of the two addresses listed below:

Director, Division of Reclamation
Indiana Department of Natural Resources
14619 W State Road 48
Jasonville, IN 47438
800 772-6463
Revised 01/31/11

United Minerals Company, LLC
P.O. Box 400
Huntingburg, IN 47542
812 683-5024

AUGERING OPERATIONS

PERMIT ID #S-357
 ATTACHMENT IV.L.C.1. & C.2
 REV DATE 10/31/12

In the event augering is conducted on this permit area, site specific data including any necessary attachments listed below, will be submitted and approved by the DOR prior to the initiation of any augering activities.

A. Show the location(s) and extent of all auger mining operations on the Operations Map.

See Map 6, Operations Plan Map.

B. Will any method other than circular auger extraction be used?

☒ YES ☐ NO

If "YES", describe the equipment and extraction methods to be used:

The ADDCAR highwall mining system may be used on this permit area.

C. Provide a typical cross-section which shows the highwall, coal seam(s) to be augered, overburden above the coal seam(s), spacing of auger holes, and estimated depth of proposed augering operations.

See Attachment IV.L, Item C.1 and Item C.2.

D. Provide a description of the variability in thickness for each overburden stratum at the location(s) of augering operations shown in Attachment IV.L, ITEM A.:

See Part V.

E. Will augering operations be conducted within the zone of influence of any critical structures?

☐ YES ☒ NO

If "YES", describe all steps to be taken to protect critical structures from adverse impacts from the augering operations:

F. Is subsidence planned for any of the areas shown in Attachment IV.L, ITEM A.?

☐ YES ☒ NO

If "YES",

1. Clearly identify on the Operations Map those areas where subsidence is planned.
2. Provide the maximum expected surface subsidence with corresponding subsidence profiles and the basis for those estimates:

AUGERING OPERATIONS

PERMIT ID #S-357
 ATTACHMENT IV.L.C.1. & C.2
 REV DATE 10/31/12

3. Will a monitoring program be established to verify subsidence occurrence and predictions?

☐ YES ☒ NO

If "YES", provide a description of the monitoring program to be established. If "NO", provide justification to support that a monitoring program is not appropriate.

G. Provide a discussion of each augering configuration in terms of the diameter, spacing and length of auger holes and its relationship to subsidence control or prevention. Include information supporting conclusions about the long and/or short term stability of the augered areas. Provide any assumptions made to determine stability and the basis of those assumptions. Provide the geotechnical strength characteristics of the coal to be augered and surrounding strata:

Auger mining operations may be performed on the IN #V, VI or #VII coal seams at pit highwalls and endwalls, during and following surface mining operations. No subsidence is planned to result from these operations. Additionally, auger mining is not proposed for areas within the zone of influence for critical structures. Horizontal penetration will vary, and may extend up to a $\pm 300'$ advance. Geologic information is contained in Part V of the application. Engineering design calculations along with the supporting geotechnical data will be submitted for review and approval as Attachment IV.L, Item G.I when site specific augering plans are finalized. This will be completed and approved prior to the start of any augering operations. The Holland Formula for pillar safety factor calculation and the Vesic-Speck Formula for floor safety factor calculation are employed for design purposes. Minimum safety factors of 1.8 will be maintained for coal pillars (Holland) and 1.5 for floor (Vesic-Speck). Safety factors and spacing are based upon typical geotechnical values.

H. Provide the manner in which the auger holes will be backfilled with compacted materials in accordance with 312 IAC 25 including the methods to be used, the type(s) of material to be used to plug and seal auger holes, and the specific schedule to be followed for sealing auger holes:

Each entry will be plugged within 30 days with non-combustible, impervious material if it is not discharging. In the event holes are discharge water containing acid or toxic forming materials, it shall be sealed within 72 hours after completion by backfilling and compacting, with non-combustible and impervious material 12 feet into the hole, so as to form a water tight seal.

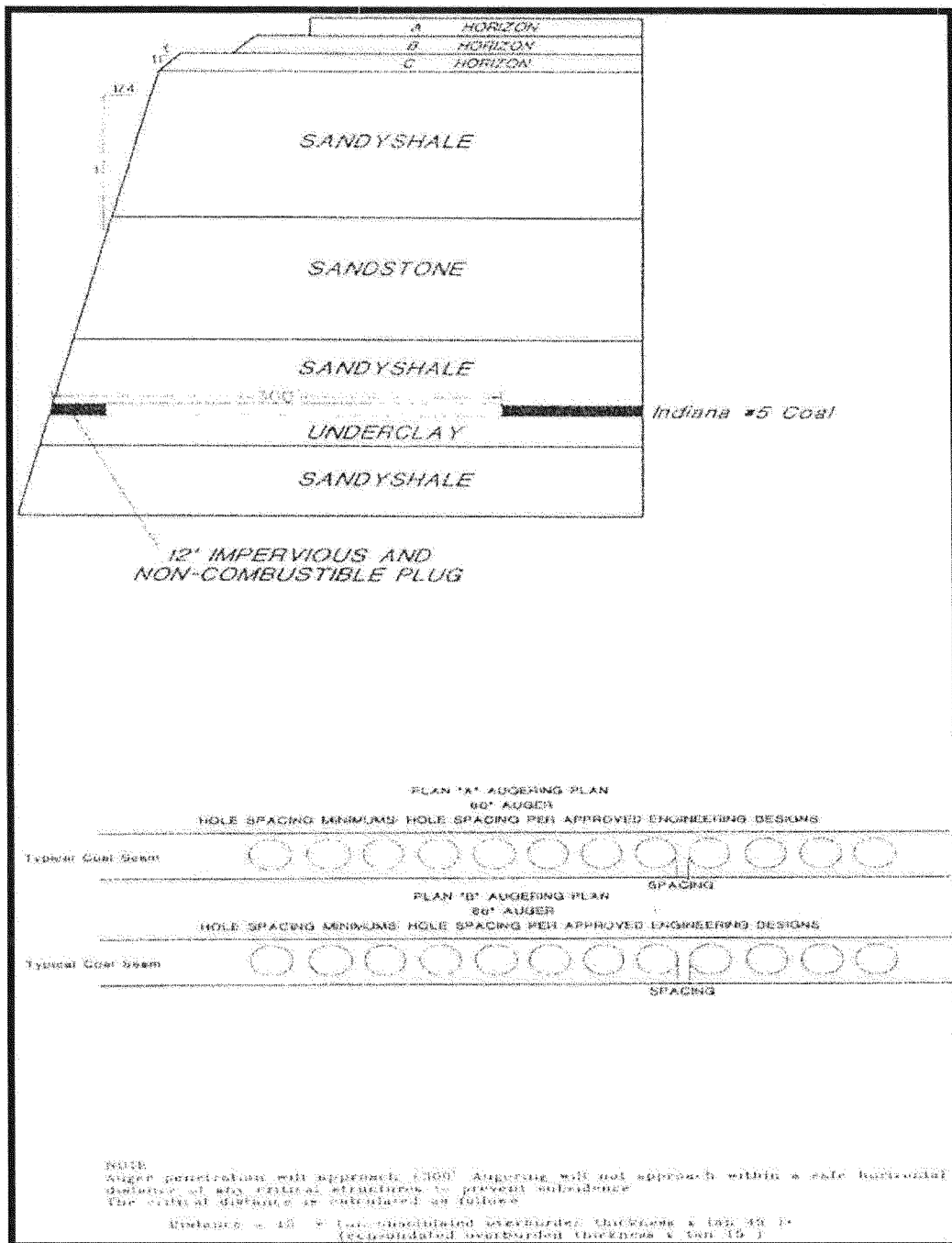
I. Describe the timing and coordination of the proposed augering operations with the surface mining operations, including the timing of final backfilling, grading and highwall elimination:

The haulback method is employed for surface mine operations, whereby overburden from the advancing pit is placed in the preceding cut. The auger mining operation will be performed in an open pit after the coal has been removed and prior to the initiation of backfilling and grading operations. Following the completion of auger mining, the area will be backfilled and graded to eliminate highwalls and achieve the approved postmining contours. Soil materials will be redistributed as appropriate, and the area restored to the appropriate postmining land uses. These activities will be completed as contemporaneously as practicable, and will meet the requirements of 312 IAC 25-6-49 thru 25-6-52.

J. Describe the plan to be implemented to mitigate any adverse impacts of the augering operations in the event that damage results from those operations:

AUGERING OPERATIONS

PERMIT ID #S-357
 ATTACHMENT IV.L.C.1. & C.2
 REV DATE 10/31/12



Permit ID	S-00357
Attachment	IV.M
Rev Date	03/18/13

Mining Near Underground Mines

Attachment IV.M.

Mining Near Underground Mines

- A. Using information from all known maps, mine records, drilling activities or other sources, show the identity, location and extent of any underground workings within 500 feet of the proposed surface mining activities on the Operations Map (Map 6).

See Map #6, Operations Map.

- B. List all sources of information used to identify, locate and determine the extent of underground works shown above:

Indiana Geological Survey
Distribution, Structure & Mined Areas of Coals in Warrick County, Indiana.

- C. For each underground mine identified in ITEM A above, indicate the dates that the underground mine was active, coal seam(s) mined, depth of coal seam(s) mined:

Underground Mine Identity	Dates Active	Coal Seam(s) Mined and Depth(s)
Ditney Hill Mine	1940 – 1965	Hymera Coal Seam - 97 feet

- D. 1. For each active underground mine, provide as Attachment IV.M., Item D.1., a description of the nature, timing and sequencing of proposed surface mining activities with the nature, timing and sequencing of activities in the underground mine.

No active underground mines are known to exist within 500 feet. No mining into abandoned underground mine works is being proposed. Every effort will be made to avoid mining into any underground mining works (see Item D.2. below).

2. For each abandoned underground mine, provide as Attachment IV.M., Item D.2., a discussion of any barriers that are to be maintained between the active surface mine and the abandoned underground works and the manner in which such barriers will be maintained during surface mining.

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Attachment IV.M, Item D.2.

Coal/bedrock extraction will not occur within 100 feet of any known abandoned underground works (regardless of dry, or water inundated).

Before bedrock/coal extraction within 500 feet of the abandoned underground works, a void in the old works will be penetrated by exploratory drilling to determine if the old works are flooded. If the old works are dry, surface mining operations will proceed as planned, and no further action will be taken. If the old works are inundated (flooded), a measurement of the water level in the drill-hole will immediately be conducted and reported to the Division of Reclamation mine inspector, and further exploratory drilling will be performed to delineate the extent of the old works. Drilling will be conducted on 50 foot centers in a line along the assumed Indiana Geologic Survey mapped boundary (see Map 6). Drill-holes which encounter old works will be bracketed by a series of four (4) additional holes on 50 foot centers until all holes are located in solid bedrock/coal. The line of solid bedrock/coal holes will be assumed to be the extent of the old works and no bedrock/coal extraction will be conducted closer than 100 feet of this line. Locations of the holes that contacted old works will be both accurately mapped, and clearly flagged and marked in the field to provide as a visual reference. All holes will be plugged immediately after drilling as planned in Attachment IV.H.2 of the S-357 permit.

Surface disturbances (non-bedrock/coal extraction disturbance) associated with the S-357 mining may be conducted above the underground works (within 100 feet), such activity not expected to have any adverse affects.

- E. Provide a statement that the proposed operations will not have an adverse effect upon the prevailing hydrologic balance as a result of the operation's proximity to abandoned underground mines and the basis for that determination, or provide a plan to monitor surface and mine water elevations that will document any interaction between the surface mining activities and the abandoned underground mine(s) as Attachment IV.M., Item E.

Attachment IV.M., Item E.

The barriers and the measures to maintain these barriers discussed in Item D.2. above provide the necessary margin of safety to insure that the mining activities don't have any adverse effects on the prevailing hydrologic balance as it relates to the abandoned underground works.

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- F. Describe how the proposed activities will result in improved coal recovery, abatement of water pollution, and elimination of hazards to the health and safety of the public:

See Item(s) D.2., and E. above. Establishment of a 100' buffer zone will allow unimpeded coal recovery within proposed S-357 extraction limits (see Map 6) and still maintain the level of mine pool water in the abandoned underground mine works (expected to be inundated). Maintaining water in inundated underground works will reduce adverse effects to the public's health and safety that could potentially be a result of subsidence via de-watering such underground works.

Should future observation of that considered to be an excessive quantity of ground water discharging from endwall exposed Coal VI (or its proximate bedrock) adjacent to inundated underground works, the applicant will immediately contact applicable Division staff to determine if further necessity exists to install a piezometer in an up-gradient void of the abandoned works to conduct ongoing water level monitoring as a further protective measure.

- G. Provide a plan to be implemented to minimize potential impacts in the event that the surface mine operations encounter flooded abandoned underground mines:

Drilling will be used to determine and document that un-mined bedrock/coal laterally separates S-357 coal recovery limits from any abandoned underground works (located in Sections 28, 33, and 4), insuring that the active coal recovery area does not mine into old works (see Item D.2.).

In the event mining operations unintentionally encroach into the dry underground works, spoil material will be pushed into and up against the old works and compacted with the loader. If operations unintentionally encroach into flooded works, the water will be treated as necessary and pumped into an approved sediment control structure. Spoil material will then be pushed into and up against the old works and compacted with the loader. Water discharges from underground works will ultimately be through approved NPDES discharge points and will be made to comply with applicable water quality standards.

In the event damage occurs (determined to have been caused by surface mining operations of the S-357 permit area), it will be mitigated on a case by case basis depending on the type and extent of the damage, and consistent with applicable requirements of 312 IAC 25-6-123.